ICE and REFRIGERATION

THE NA
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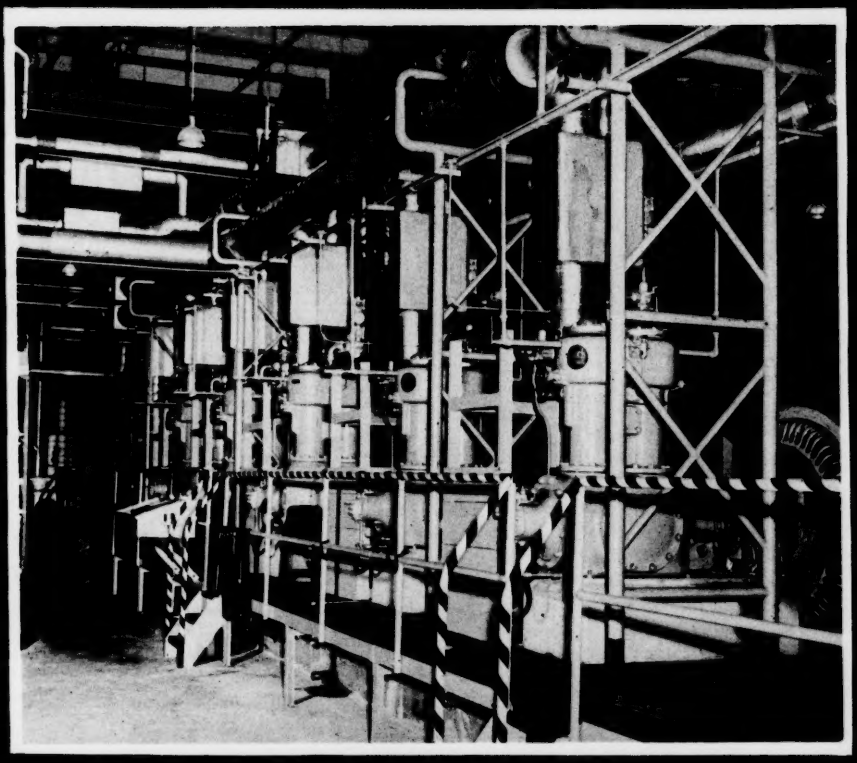

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SEPTEMBER • 1952

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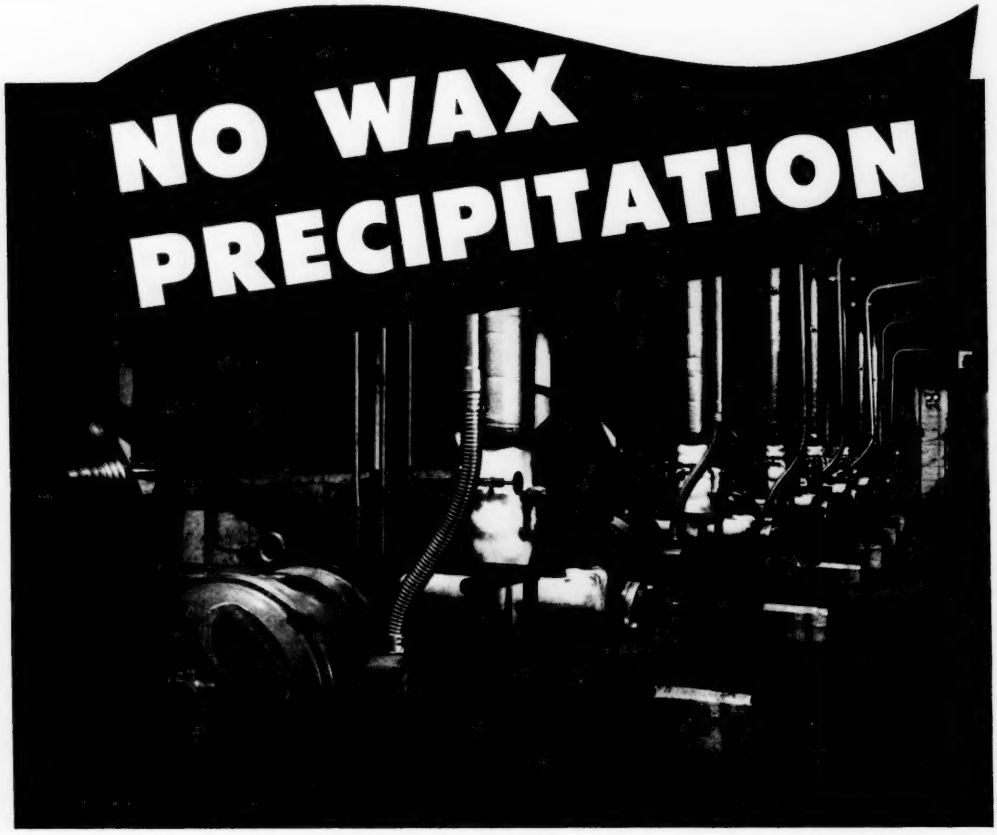


. . . when you lubricate compressors with TEXACO CAPELLA OIL *(Waxfree)*

In refrigerating — even down to minus 100° F. — you'll get *no wax precipitation* in systems with *Texaco Capella Oil (Waxfree)*. So, whether you need extremely low temperatures or just "normal" cold, you're bound to get clean, efficient compressor operation with *Texaco Capella Oil (Waxfree)*.

Haze and floc temperatures of *Texaco Capella Oil (Waxfree)* are outstandingly low — field experience as well as tests prove that. And, for purity, stability and resistance to oxidation, *Texaco Capella Oil (Waxfree)* is also unexcelled. It's moisture-free, does not react with refrigerants, does not foam.

There is a complete line of *Texaco Capella Oils (Waxfree)*, available in refinery-sealed 55-gallon drums; 5-gallon, 1-gallon and 1-quart containers. Let a Texaco Lubrication Engineer help you select the one to give you best performance from your compressors, whatever the temperature, operating conditions, or refrigerants used.

Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, New York.

TEXACO Capella Oils (Waxfree)

FOR ALL REFRIGERATING AND AIR CONDITIONING COMPRESSORS

Faithfully yours 50 *for Fifty Years*

TUNE IN: On television—the TEXACO STAR THEATER starring MILTON BERLE. See newspaper for time and station.

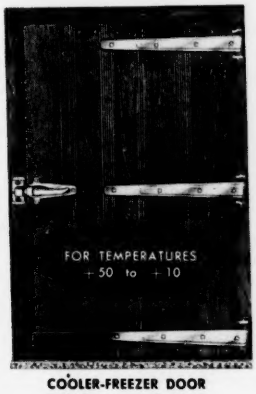
"Butcher Boy"

REFRIGERATOR DOOR CO.

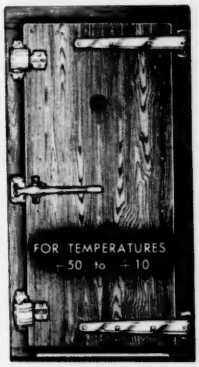
STRONGEST
MOST DURABLE
ONLY 100% MODERN

REFRIGERATOR DOORS
BUILT IN THE WORLD

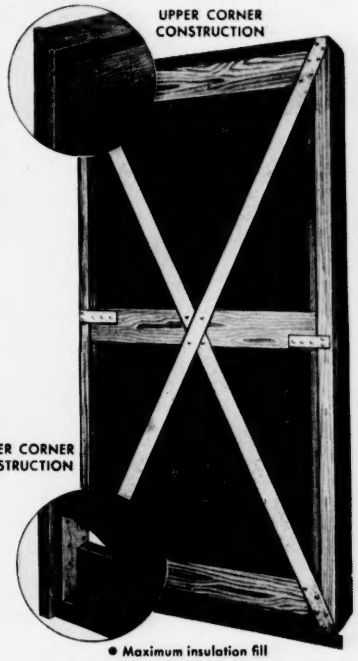
NEW "X-TYPE" DOORS
FEATURING "X-TYPE" STEEL DIAGONAL BRACING



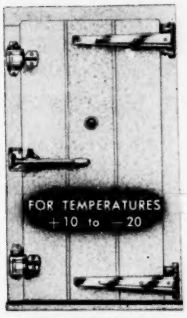
COOLER-FREEZER DOOR
- Modern streamlined job
- 100% "Douglas Fir"
- Sanitary hardware



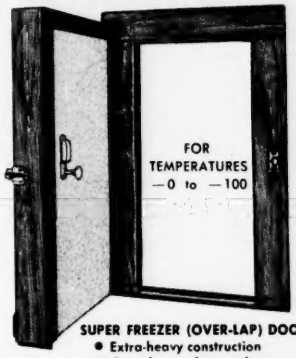
X-52 PLYWOOD PANEL DOOR
- Plywood front and back
- Extra heavy-duty hardware
- Special type gaskets



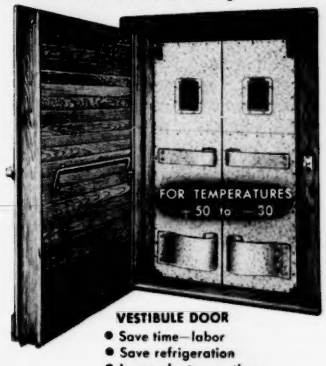
- Maximum insulation fill
- Most possible rigidity
- Allows reversal of swing



LOW TEMPERATURE DOOR
- Entire metal-clad front
- Extra heavy-duty hardware
- Special type gaskets

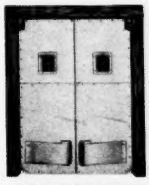


SUPER FREEZER (OVER-LAP) DOOR
- Extra-heavy construction
- Extra-heavy duty gaskets
- Extra heavy-duty hardware

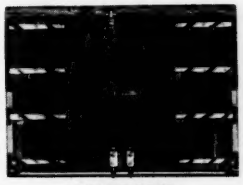


VESTIBULE DOOR
- Save time—labor
- Save refrigeration
- Large plant operation

TRACK DOOR
- For abattoirs
- Meat handling rails
- Banana rooms



AUTO-CLOSE DOOR
- For loading dock
- Intra-cooler doors
- Heavy trucking



DOUBLE DOOR
- For palletizing
- For carloading
- For elevator shafts

When a Man Thinks Twice ...He Makes Comparisons!

BUTCHER BOY REFRIGERATOR DOOR CO. • 170 N. SANGAMON ST., CHICAGO 7, ILL.

AVAILABLE NOW!

The first motion picture on SNOW MELTING SYSTEMS

Now, for the first time, you can actually see these modern snow removal systems in operation. In the last few years, a great amount of material has been written and published on snow melting systems, but our new film, "A Winter Wonder," takes you "on location" and shows you how Byers Snow Melting Systems came through recent winter snowfalls in a wide variety of applications.

This professionally-produced film reviews the entire snow melting subject from installation to performance. You'll see how coils of Byers Wrought Iron pipe, embedded in concrete, and carrying hot water-anti-freeze solution, brought hazard-free surfaces to sidewalks and driveways of private homes, commercial buildings, industrial plants, service stations, and many others. In addition to these interesting scenes of "snow melting at work," you'll watch actual operation of installing, welding, and covering prefabricated grids of genuine wrought iron pipe.

Based on the greatest pool of engineering experience on snow melting in existence today, "A Winter Wonder" has been developed as a service to the designer, fabricator, contractor and building engineer. If you share today's widespread interest in snow melting systems, you'll find the practical and factual material in this film both interesting and helpful.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Division: New York, N. Y.

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Please send me at once:

- ☐ Your descriptive folder on how to apply for a showing of your 16 mm sound motion picture "A Winter Wonder"
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Tear out this coupon, attach it to your letterhead, sign your name and title and mail to:

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ICE and Refrigeration

VOLUME 123 NUMBER 3

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September, 1952

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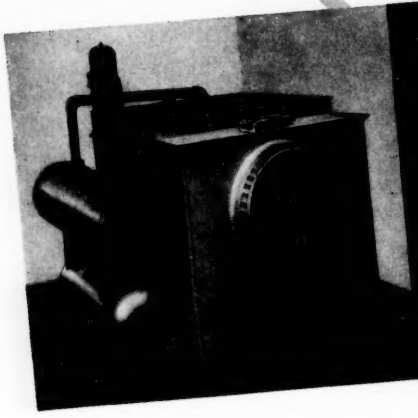
New

SAVES WATER and CUTS MAINTENANCE COSTS . . .

Illustrations show two views of a 35 ton Condenser Tower prior to partial disassembly for shipment.



Vogt

CONDENSER TOWER

FOR CONDENSING REFRIGERANTS

SINGLE RESPONSIBILITY:

Vogt, leading builder of refrigeration condensers, assumes responsibility for engineering the unit. Only one purchase order needed.

SHOP FITTED:

To cut down field assembly labor. Requires no cutting or fitting of pipe.

Designed for today's water conservation requirements, and to keep refrigeration costs low, the *new* Vogt Condenser Tower meets the need for a proven, readily cleanable condensing unit.

The Vogt Condenser Tower consists of a multipass straight tube condenser, a receiver, an oil trap, a cooling tower, and a water pump. Removable cast iron heads permit easy cleaning of the condenser tubes.

Water costs are extremely low since the cooling water is recirculated continuously and requires only a small amount of makeup to replace losses due to windage and evaporation.

Condenser Tower units are available in capacities ranging from 5 to 50 tons refrigeration. Additional information will be furnished upon request.

HENRY VOGT MACHINE CO., Louisville 10, Kentucky

BRANCH OFFICES: NEW YORK, PHILADELPHIA, CLEVELAND, CHICAGO, ST. LOUIS, DALLAS, CHARLESTON, W. VA.

...with air-conditioning and refrigeration controlled throughout by ALCO VALVES

990 ft. from stem to stern, the United States carries 2,000 passengers in luxury and safety. She's the first big ship ever built that is completely air-conditioned and fireproof.

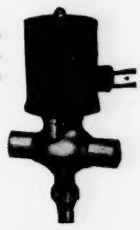
In choosing valves to control her vast air-conditioning and refrigeration systems, wise engineers turned to ALCO. The reason: ALCO VALVES assure the dependable, trouble-free service required of equipment that serves at sea.

There's a trouble-free ALCO VALVE for every application...large or small

THERMOSTATIC EXPANSION VALVES—Single or multi-outlet. For automatic liquid refrigerant control in all types of air-conditioning and refrigeration systems.

EVAPORATOR PRESSURE REGULATORS—Maintain constant evaporator pressure regardless of sudden load changes.

SOLENOID VALVES. Tight seating and packless. Moisture-proof to stop coil burn-outs.



SEE YOUR ALCO WHOLESALER

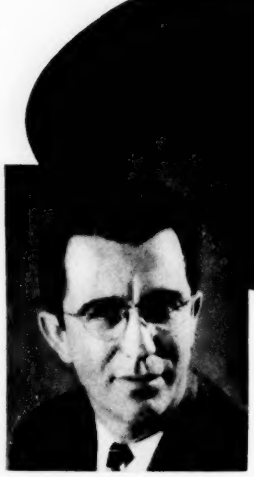
ALCO VALVE CO.

835 KINGSLAND AVE. • ST. LOUIS 5, MO.

Designers and Manufacturers of Thermostatic Expansion Valves; Evaporator Pressure Regulators; Solenoid Valves; Float Valves; Float Switches

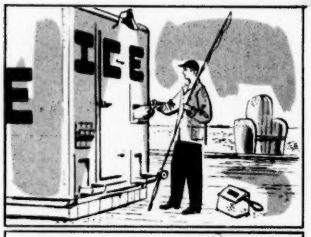
5356

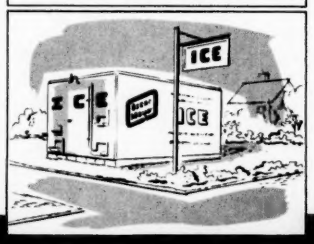
TAKE A TIP FROM A MAN WHO'S MADE IT PAY



George W. Heath
Manager, Ice Division
Oscar Mayer & Company
Madison, Wisconsin

George W. Heath tells you how Oscar Mayer & Company buys its Ice Bags: "First and foremost, we want maximum wet-strength protection. Effective closures are important. Wire for the large bags, tin ties for the smaller ones. We require good printing, top service and competitive pricing. We have purchased all of our Ice Bags from Union for as long as we have sold ice in paper bags."





FAMILIES who have access to automatic vending machines buy processed ice early in the morning, late at night, right around the clock.

VENDING machines are an answer to increased labor and delivery costs. People can get ice in convenient, clean wet strength paper bags where they want it, when they want it, and as they want it.

OPERATORS have found that buyers will stop at vending machines and pick up ice where they would not bother to call and wait for it to be delivered. Units which are properly located and maintained have advertising value that creates immediate impulse sales.

IN ADDITION to block ice, vending machines create heavy traffic for small bags of ice cubes and crushed ice. Proper bags are important. Good - looking, dependable wet - strength Union bags are one of the best merchandising aids you can have.

TRADE MARK
UNION

Full Electric Fork Truck Operation in 6 FOOT AISLES*

The ALL NEW LEWIS-SHEPARD SPACEMASTER MODEL "M"

at ½ the usual Electric Fork Truck cost

Straddle Type
3000-4000 lbs.
capacity

40% More Storage Space... The "M" uses only 6 feet of this 10 foot aisle, leaving room for an extra row of stacked loads.

You get more travel speed with more stability, plus higher lifts at faster speeds than with any similar truck . . . All controls are in the palm of one hand for quicker, safer operation.

*With 42" long, 48" wide loads

LEWIS-SHEPARD

Check L-S First . . . Get the Facts

LEWIS-SHEPARD
1026 Walnut St., Watertown 72, Mass.

I want to hear more about the new "M" Model.

Name_____

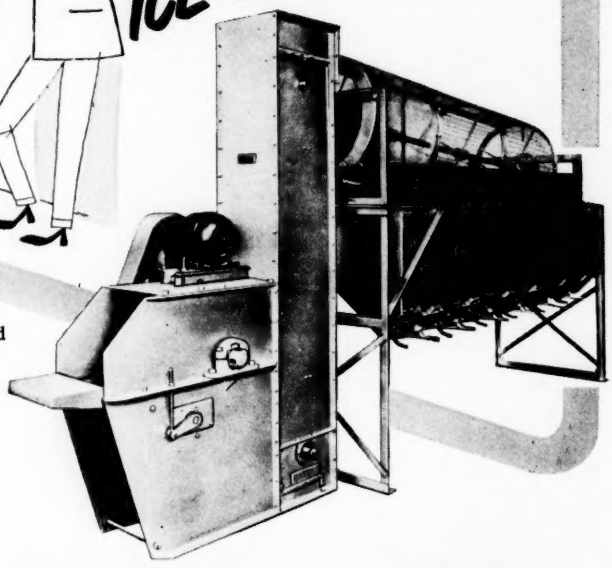
Company_____

Street_____

City_____ State_____

right to size . . .

G-W ICE SIZING UNITS



In elevator height, in bin capacity, in dimensional requirements, there's a Gifford-Wood Series S-16 Unit that's right to size for your ice plant operation. These G-W S-16 ice sizers are tailor-made in four models to deliver the maximum in saleable ice from every cake processed. And backed by 138 years' experience in the industry they give better all-round results because they're better engineered in . . .

BREAKER CONSTRUCTION • **ELEVATOR PERFORMANCE** • **SCREENING AREA**

Correctly pitched, curved picks work cake at right angles for efficient, controlled slicing action.

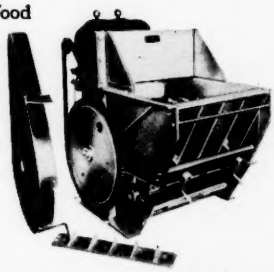
Steady, consistent flow of ice particles to screen with minimum waste is insured by closely spaced, continuous flights.

Screens are rotary in design, ample in area to guarantee a clean, uniform product.

Sound engineering design of these three essentials, plus careful planning and rugged construction of every detail make the Gifford-Wood Series S-16 Sizers made-to-order for you. Write for Bulletin 482.

AND REMEMBER, TOO,

. . . there's a Gifford-Wood Ice Breaker built to fit your particular need — from models delivering 50 tons per hour, down to manually operated models. All are built for heavy, continuous service and trouble-free operation. Write for Bulletin 482.



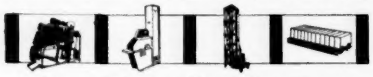
Model 480-MD Heavy Duty Ice Breaker is built for the roughest service with a capacity of up to 50 tons per hour.

GIFFORD-WOOD CO.

NEW YORK 17 *Since 1814* CHICAGO 6

420 Lexington Avenue HUDSON, N.Y. 565 W. Washington St.

Pacific Coast Representative: Western Ice Equipment Company, 420 Market St., San Francisco 11



Cuber Breaker-Elevator Tiering Machine Conveyor

Merchant's Refrigerating Company Picks Modern Carrier Ammonia Equipment

New warehouse at Hopkins has 1,750,000 cu. ft. refrigerated space on one floor

They can freeze up to 300,000 pounds of bulk every twenty-four hours at the new Merchant's warehouse in Hopkins, Minnesota, capable of storing 21 million pounds of food products. They can handle products quickly and easily because the entire warehouse is on one level.

Modern Carrier ammonia refrigerating equipment was selected for this job because it fit so well into the modern design of this new warehouse. Its compactness saved space. Its accessibility saves time. Its economical operation saves money.

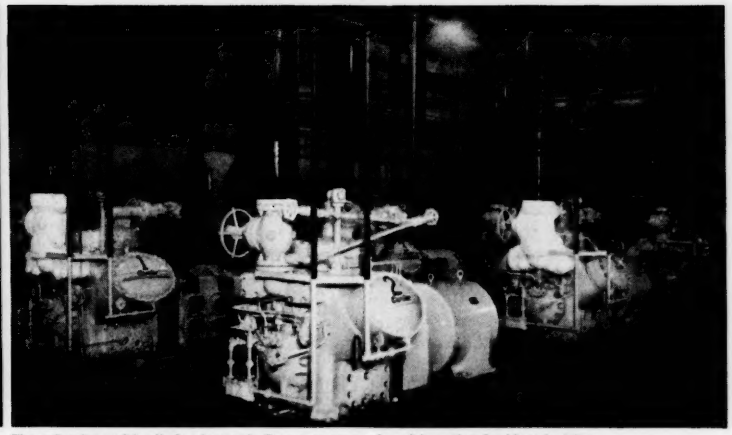
Carrier Reciprocating Ammonia Compressors, in a low temperature two stage system, serve the frozen food storage rooms maintained at $-10°$F as well as the blast freezers operated at $-30°$F.

For efficient, economical heat disposal, six Carrier Ammonia Evaporative Condensers are located on the roof of the engine room.

Carrier Ammonia Cold Diffuser coil and fan assemblies, mounted above the blast freezer spaces, provide a steady flow of sub-zero air, which is evenly distributed over the product to be frozen by special directional air discharge ducts.

Carrier

AIR CONDITIONING
REFRIGERATION
INDUSTRIAL HEATING



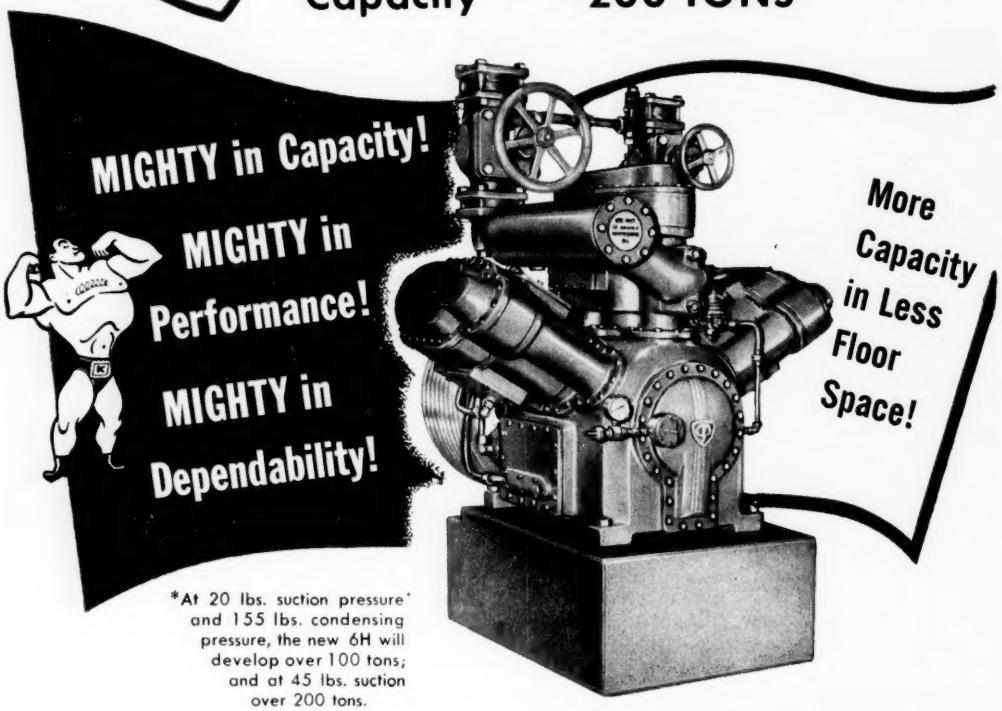
These Carrier multi-cylinder Ammonia Compressors supply refrigeration for blast freezing and freezer storage. They're direct driven by 720 rpm synchronous motors. Carrier Ammonia Compressors come in a wide range of capacities, from 5 to 200 horsepower.

Announcing the **NEW**

6H TYPE "K" 6 Cyl.

Ammonia Compressor

Capacity UP TO 200 TONS*



*At 20 lbs. suction pressure and 155 lbs. condensing pressure, the new 6H will develop over 100 tons; and at 45 lbs. suction over 200 tons.

This newest member of the CP Type K family of Compressors is a compact giant. It delivers *more capacity* in *less floor space* than ever before in CP's more than half-century of refrigeration experience.

Rugged and Proven Design Features

The new CP 6H Type "K" 6 Cyl. 6¾ x 5 Compressor is of rugged, heavy construction . . . insuring easy, continuous operation at full capacity. It embodies all such time-tested and proven features of the CP Type "K" compressors as full water-jacketed cylinders, water-cooled seal bearing, oil cooler to insure cool-running bearings and crank case, force-feed lubrication, automatic capacity control, unloaded starting, and CP shaft seal.

If you need big capacity in small floor space . . . if you want continuous dependability that means lower operating cost—for years to come—investigate the new CP 6H Type "K" Compressor.

THE *Creamery Package* MFG. COMPANY

General and Export Offices:
1243 W. Washington Blvd., Chicago 7, Illinois

SALES BRANCHES IN 21 PRINCIPAL CITIES

MAIL COUPON TODAY!

The Creamery Package Mfg. Company
1243 W. Washington Blvd.
Chicago 7, Illinois

Send us information on the new CP 6H Ammonia Compressor with capacity up to 200 tons.

Name.....

Company.....

Address.....

City.....*Zone*.....*State*.....

In the Spotlight

HOW TO UTILIZE modern handling methods in warehouses where the construction and layout makes it not feasible to install complete palletization, is a subject of much interest to many warehousemen. It is fully discussed and illustrated in the article starting on page 13.

A COMPANY SIGN on its own building is an effective and economical means of advertising a business. Some ideas on this, and an attractive example, are given in the article on page 18.

FRESH-ICED chicken is now being promoted by Armour & Co. with advertising and dealer helps, including displays at poultry shows and conventions. For details, see page 25.

FROZEN JUICE concentrates must be held under proper temperatures in storage and in transit from the production centers to marketing destination and in the consumer's home. A booklet has been issued by the Minute Maid Corporation on this important subject. It is reviewed on page 49.

THE ALBERTA ICE CO. Ltd. has completed a new ice manufacturing plant at Calgary, Alta, Canada, the largest and most modern ice making plant in Canada. See page 27.

ICE was used on a hot day in July to cool the swimming pool in an Ohio city after swimmers had complained that the water was too hot.

THE ANNUAL convention of the National Association of Ice Industries will be held at the Netherland Plaza Hotel, Cincinnati, Ohio, November 11 to 14. A preview of hotel facilities and the convention program is given on page 23.

COVER: View of engine room in new U. S. Army cold storage plant at Alameda, Calif., showing six of the seven compressors. Note meticulous housekeeping. See story on page 33.

AMMONIA DAMAGE to stored fruits and nuts and the use of sulphur dioxide as a corrective treatment was the subject of an experimental study by the United States Department of Agriculture at Fresno, Calif. A review of this study starts on page 19.

A HUGE cold storage plant, 1,600 feet long and 200 feet wide has been constructed by the United States Army Quartermaster Corps at Alameda, Calif. For illustrated description, see page 33.

WHEN A Sacramento ice and cold storage plant saw its accident record and insurance costs mount to fantastic heights, it installed a safety program which, at the end of three years, cut the loss ratio from 645 to 4 per cent. The president of the company tells the story in the article on page 37.

THE N. A. P. R. E. CONVENTION to be held November 12 to 14, 1952 at Dallas, Texas will present a big show in an attractive setting. For preliminary announcement of the educational program and entertainment features, see page 42.

A REVIEW and forecast of the refrigerated warehousing industry was presented by a Canadian warehouseman at a meeting of the Canadian Warehousemen's Association. This address is published in full, starting on page 31.

60 Years Ago

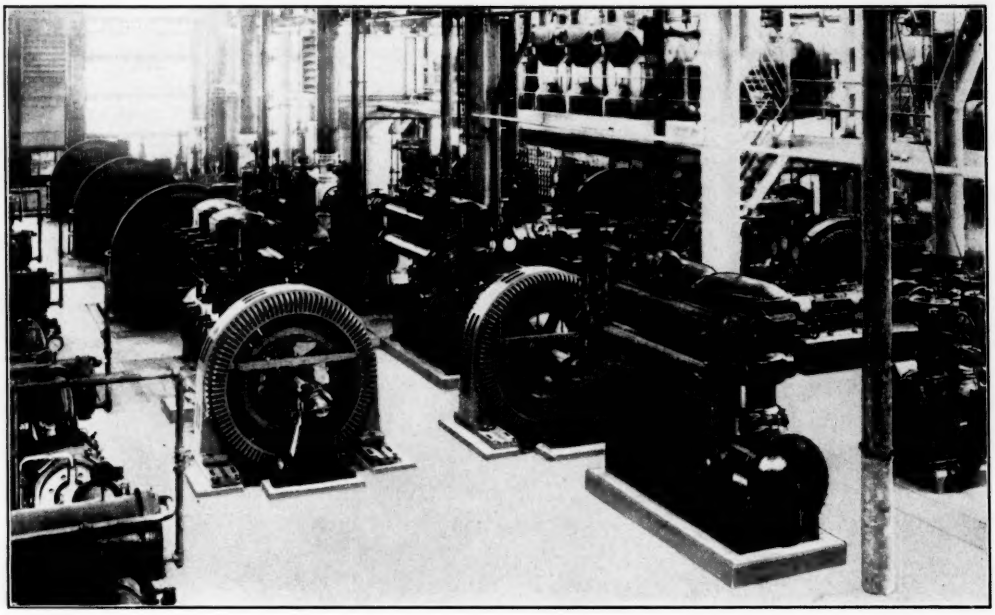
From the September, 1892 issue of ICE AND REFRIGERATION

THE LARGEST refrigerating machine in England was installed in the ice making and cold storage plant in the Linde British Refrigeration Co., Lower Shadwell, London. The plant was erected in 1887 from designs made by Prof. Linde, inventor of the Linde type of refrigerating machine. The refrigerating system was based on the evaporation of liquid anhydrous ammonia and recovery of liquid by compression. Besides providing block ice for the domestic and commercial trade the company iced fishing boats that came alongside and tied up at the neighboring fish quay of the Shadwell fish market. As much as 75 tons were supplied to these fishing boats daily during the season. Ice making capacity was 130 tons per day with cold storage space of about 60,000 cubic feet.

THE ICE TRADE reported a good month during August, after a slow start of the ice season. The entire four weeks were warm, generally hot, and the demand for ice had been large. Prices would seem to be generally very well maintained and in some localities a slight increase had been made without friction.

A HUNGARIAN scientist, according to a news report, proposed the use of intensely low temperatures for cooking meats. He said that extreme cold has the same chemical and physical effect as heat. He says he recently applied his method to the preservation of various kinds of meat, first subjecting them to a temperature of minus 33 F and then sealing them up hermetically in tin vessels. After some time he opened them and found the meat extremely palatable and partially cooked, very little heat being required to prepare it for the table.

TRANSPORTATION of fresh fruit shipments from Cape Town, South Africa to London was reported by the California Fruit Grower, made in refrigerator steamships. For transportation of fresh meats, a temperature of 22 to 26 F is needed, while for the proper care of fresh fruits a temperature of 38 to 42 F is all that is required. The first through shipment of fruit by the C. F. T. and White Star line of steamers from California to London arrived in good shape.



Celanese Corp. Uses 6420 Horsepower of Frick Refrigeration

Fourteen Frick refrigerating machines are in operation at the Amcelle plant of Celanese Corporation of America, near Cumberland, Md., makers of chemical yarns. Most of these ammonia compressors have been in use since 1929. The motors driving the new vertical machines, shown in the foreground, are each of 1250 horsepower.

This is a large-scale example of the dependability and economy of Frick ammonia refrigeration. Power requirements, when operating in summer weather on air conditioning loads, are only 0.70hp. per ton of refrigeration.

The really important jobs, whether for air conditioning, ice making, or other commercial cooling work, call for FRICK refrigeration.

DEPENDABLE REFRIGERATION SINCE 1882

FRICK CO.

WAYNESBORO, PENNA. U.S.A.

Also Builders of Power Farming and Sawmill Machinery

Handling Costs Can Be Reduced Without Complete Palletization

How the fork-truck-pallet system can be modified or alternate methods used to improve warehousing operations and reduce costs under conditions that are less-than-ideal

D. O. HAYNES
Consulting Industrial Engineer

COLD storage operations carried on in plants erected before the days of modern handling methods do not always lend themsleves to complete palletization. This is frequently true even in old single-storied structures, but it is especially apt to be the situation in multi-storied buildings. This does not mean, however,

In warehouses built before the days of mechanized handling methods, it is not always possible to utilize modern palletization. This is especially true in the case of the older multi-storied buildings. But this does not mean necessarily that the operation must be continued indefinitely on a manual handling basis. This article points out possible modifications in the fork-truck method of handling, or other methods which may be utilized to reduce handling costs under less than ideal conditions.

that nothing can be done about reducing handling costs under less-than-ideal conditions. It is the purpose of this article to point out the modifications which can be made in the pallet-fork-truck method of handling in order to gain at least some of the advantages which it affords and, should these changes prove to be inapplicable, to suggest certain other methods which should be investigated before it is assumed that the operation is forever committed to manual handling.

Financial Aspect

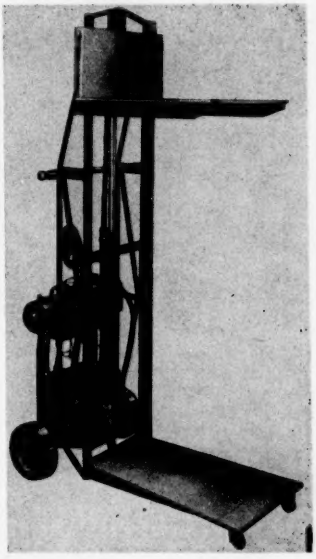
Let us first take a look at the financial aspect of the problem. Of necessity, a consultant must view a materials handling program from a dollars-and-cents point of view. What will it save? How much investment will it require? It is his obligation to his client to give him these cold, hard cash figures. But, in addition to the direct financial benefits to be derived from mechanized handling there are usually by-product, but difficult-to-measure advantages. How can one place a monetary value on such intangibles as improved service to customers, less damage to merchandise, easier inventorying and reduced worker fatigue?

Then again, there are cases such as the warehouseman who decided to install a very advanced type of dockboard, even though the cost could not be justified from the standpoint of the savings it might effect. He was located off the rail lines in his city and wanted to attract all the truck-carried traffic possible by advertising that he had the last word in equipment for reducing truck terminal time. And so, should you find that you cannot expect to receive a handsome return on your investment, there may be other than financial reasons for improving handling methods in your plant.

Palletizing Costs

You may have been wondering about the financial feasibility of palletizing your operations. There are no hard and fast rules in the matter, but there are some generalities which will prove useful in helping to clear up this point. The question is: Can sufficient payroll savings be secured to amortize the required investment within a reasonable time — say two and a half or three years? By investment is meant the cost of both machines and pallets.

Experience has shown that in multi-storied operations the investment in pallets amounts to approximately half the total outlay. It has also been found that 25 percent reduction in touch labor is a good figure to use in estimating what can reasonably be expected through the introduction of a complete palletization program in a house where all work had previously been performed manually. The investment required in pallets can be arrived at fairly accurately by taking 50 percent of the gross number of square feet in the refrigerated areas and multiplying this figure by 40 cents. This calculation is based on results found in the average multi-storied plant in which pallets can be tiered two high, with due allowances for aisle space, broken lots, etc. If we double this amount to allow for the needed equipment, the required total will be very closely approximated.



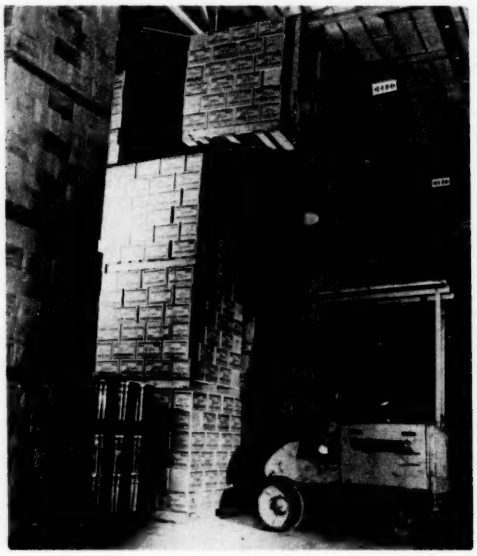
New fork-lift stacker on hand truck.

Should your calculations indicate that there is a reasonable likelihood that palletization will pay its way, the next question is, of course, whether all the conditions in your plant are favorable and if not, what modifications or other methods can be used? In order to understand fully the significance of certain building characteristics we should first have a clear picture of the kind of unit loads and the machines which will be used to handle them.

Handling Equipment

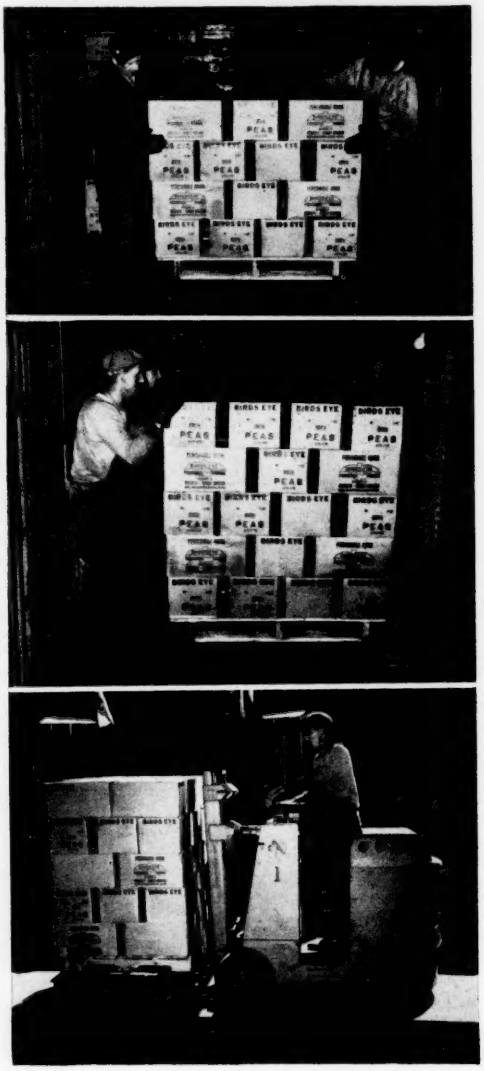
Most refrigerated plants handling the usual variety of commodities offered for cold storage have adopted 36x48 inches. When such a pallet is loaded with merchandise of this type to a height of 4 feet (4½ feet including the pallet) the unit load will average something less than 2000 pounds, although some of the denser products will result in loads which weigh as much as 2500 pounds. The dimensions of this unit load are important from the standpoint of door openings, passageways, elevator cars and ceiling heights. Its weight determines elevator and floor capacities.

What about the machines to handle these unit loads? The types which are known as "walkies" are widely used in this industry. They developed by motorizing pallet hand jacks and stackers. The name has become somewhat obsolete because some of these trucks are now made so that the operator rides on them. However, their basic operating and construction characteristics have not been changed. The outstanding feature of the high-lift machines is the outriggers which support the loads. Since they are not counterweighted they are

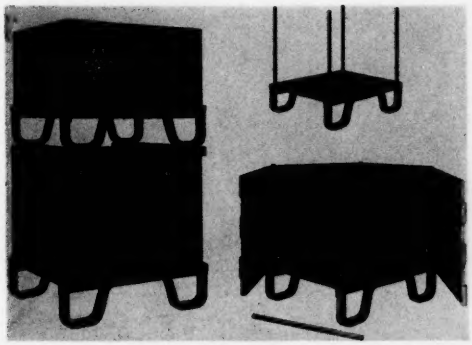


Pallet loads of frozen foods are tiered four-high by lift truck.

Tiering merchandise perpendicular to the room coils.



Top: Man assembling unit load. Absence of end racks gives them greater freedom in piling cartons. Center: About to transfer load from dolly to conveyor. The loaded dolly has been pushed to the end of the conveyor. With an easy push the palletized load rides out of the car. Bottom: Ready for transfer to checker. Unit load has had level ride from start to finish.



A modern all-steel load skid for use with power lift truck. This picture shows how skids can be made with removable sides and ends to form boxes and then stacked and also furnished with stake sockets so a load can be restrained on the skids. Photo credit Market Forge Co.

This belt conveyor serves a double purpose, the upper belt carrying cartons to an upper floor, and the lower one carrying cartons from an upper floor downward.

considerably shorter than conventional fork trucks of equal capacity and are able, therefore, to operate in narrower aisles when stacking away unit loads.

The weight of a motorized hand truck is approximately 1100 pounds and the high-lift model about 2000 pounds, both including their batteries.

Two characteristic construction features of these machines are important—small wheels and relatively low underclearances. We shall see that certain plant conditions must hold or be modified if these machines are to be usable.

Pallet Operations

Let us now consider specifically how the features of unit loads and machines influence our thinking about plant conditions so far as palletized operations are concerned.

First, the construction of the pallet on which the unit load is to ride. A 2-way pallet 36x48 inches requires that all passages through which it is to be moved be at least 54 inches wide to permit free movement and eliminate damage to merchandise should some loads overhang slightly. On the other hand, if the pallet is constructed 48x36 inches it can safely pass through openings as narrow as 42 inches wide, but only at the expense of aisle space. Every foot added to the length of a pallet calls for an additional foot of maneuvering space for 90-degree piling.

It is a rare cold storage plant indeed which can afford to sacrifice this extra aisle space, so that other solutions must be found. Why not a pallet 36x36 inches? There are two objections to such a pallet. Many of the products offered for cold storage measure approximately 1x2 feet and the only practical bases on which to pile them is one 36x48 inches or 24x36 inches. When a pallet of this latter size is used the height of the unit load must be reduced proportionately so that the amount carried per trip is considerably lessened and it is usually necessary to pile three-instead of two-high. As a result we break one of the fundamental principles of good handling—the bigger the unit load the lower the unit cost of handling—but we also secure unstable tiers with three-high on a narrow base.

Another, though admittedly not too satisfactory a solution is to place a small skid under the load with the opening of the skid under the 36-inch side of the pallet. This arrangement permits the pallet to be moved with the narrow side leading. However, when the unit load reaches the storage area the high-lift must pick it off the skid prior to putting it away and, of course, the skid must be disposed of. These extra moves are not serious as they might be and, in an extremity, this method might be considered if its use meant the difference between palletizing and not palletizing.

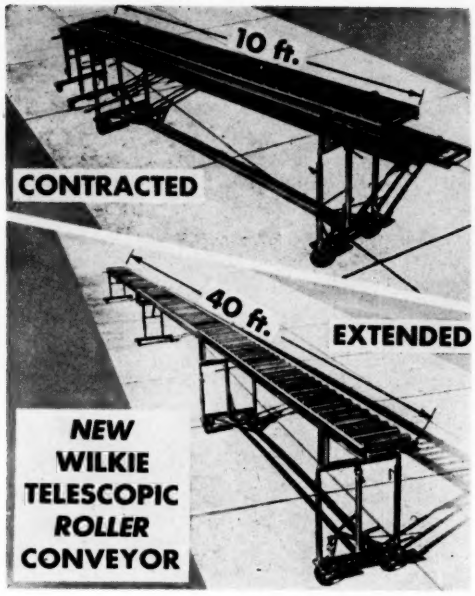
4-Way Pallets

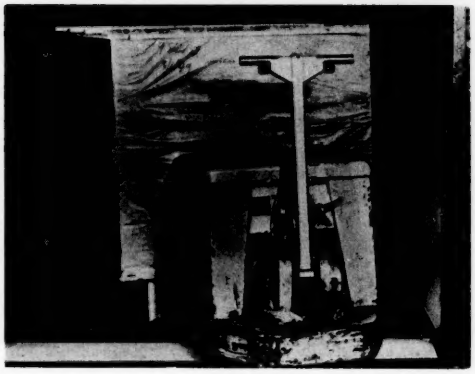
The last, and by far the most satisfactory solution to the problem is the use of 4-way pallets. This construction permits the forks of both low-and-high-lift equipment to enter the pallet from any side, so that the narrow dimension can lead through limiting doorways and then the load changed so that the most economical use of aisle space results. Of course, this type of pallet costs slightly more than the more simply constructed variety, but if the investment makes possible the palletization of an operation the additional outlay will probably be justifiable.

Elevators

Elevators have been troublesome features in many old warehouses, even with hand operations. They frequently become determining factors when we come to consider the possibility of using unit-load operations. We have mentioned the weights which are involved when our ideal unit loaders are to be handled and the fact that it is not desirable to reduce their size to any great extent. The most efficient operation results when at least two unit loads and a low-lift machine can travel together. Houses with elevators limited to 4000 pounds have found it feasible to carry two unit loads made up of the great majority of cold storage merchandise, but the machine cannot be taken along with most of these. This indicates that the elevator should have a capacity of at least 5000, or better yet, 6000 pounds.

Increasing the size or the capacity of an already existing elevator is a very costly undertaking and can rarely be justified unless the machinery has reached such a state of decrepitude that it should be replaced anyway. One warehouse on the West coast solved its elevator problem by making an opening in the outside wall at one end of a corridor on its second floor and raises unit loads to that point by means of a fork truck. Another house in the South purchased a platform lift which was installed in an enclosed frame structure





Above: Elevator sill provides smooth trucking surface into and out of elevators.

Left: Telescopic roller conveyor. At the top the conveyor is compressed to its minimum length, approximately 10 feet, compared to bottom photo where it is extended to 30 feet in a straight line. This conveyor may also be curved.

and in this way two upper stories are served with far less investment than would have been required for repairing a conventional elevator. Of course, the lift is not as efficient as a regular elevator, but we are here considering ways and means which make possible unit-load handling under less-than-ideal conditions, so that any alternative method must be considered in that light.

Floors

Instances are met every now and then where the floors of warehouses are in such condition that the small wheels and low underclearances of pallet-handling equipment would be next to impossible as a means of transporting loads. An example is the short steep ramp leading from a corridor into a room which is a cooler converted into a freezer with the required insulation laid over the old floor surface. Low slung equipment is bound to hang up when driven over such obstructions.

In other houses one finds uneven concrete floors or wooden floors in a deplorable condition. To put these in first class shape is usually a costly procedure and if such an expense is to be charged against the installation of a materials handling program, the results might not justify the outlay. Some other method must be resorted to and this brings us to a consideration of the nearest approach to the pallet-fork-truck system—the skid method of handling.

Skid Equipment

Skid equipment is usually constructed with relatively high underclearances because of its larger wheels. Skidded loads are, therefore, easier to move over rough floors than those on pallets. This feature also makes it possible to handle many of these loads with hand equipment where the distances involved are short. Of course, the skid system lacks the outstanding feature of the pallet method—pilabilty. In warehouses where this method has been adopted the unit loads are created somewhat higher than the pallet loads and the extra piling needed to make full use of the available cubic space is done manually. This is another instance of a procedure which, by and large is not satisfactory as the all-out pallet method, but if it must be used to permit mechanized handling or the unit-load principle let us see what advantages it may offer.

First, from an investment standpoint a skid system will probably require less than a pallet program. Although skids themselves are more expensive than pallets, they have a longer life and only half as many will be required if the same dimensions are used. There will be no high-lift machines and consequently fewer batteries and less charging equipment needed. The motorized low-lift equipment of the platform type is slightly less expensive than the corresponding machines used with pallets and, as we have mentioned before, hand-operated models can be used for short hauls. Now, let us see what the situations are which might indicate the use of the skid system.

In rooms with low ceilings or with limited floor loads it might well be that the skid system would be far more satisfactory than the pallet system. In such instances there is often little or no hand piling needed so that all the advantages of the unit load method of handling are obtained at a minimum investment. We have mentioned the matter of rough floor surfaces. The wheels of skid equipment approximate the size of wheels usually found on warehouse trucks so that if the floors have been satisfactory with warehouse trucks, they will probably not have to be extensively repaired to make them serviceable with skid jacks—hand or power-

This type of equipment also gives less trouble when there is considerable gap between the cars of elevators and the sills of the building. In any event, the skid system should not be overlooked as a possible substitute for the pallet system and, as we have seen, may be preferable under certain conditions.

Other Methods

Before we are willing to admit that we cannot mechanize the operations in a house there is another method of handling which should be given careful consideration. While the unit-load systems have been receiving

the lion's share of attention during the last few years the manufacturers of conveying equipment have greatly increased the adaptability of their machines to handling many types of products. They have well-trained staffs of service engineers who are qualified to advise with prospective users and to make specific recommendations on the types best fitted for a given situation.

Conveyors

It is impossible to cover the many different kinds of conveyors in an article of limited scope, but we shall mention here the most important and how they might help solve a warehouseman's handling problem. The reader who has such a problem is urged to call in one who has specialized in this field of materials handling in order to be sure of securing a setup which will meet his needs.

In taking up this phase of handling, let us first consider the possiblity of combining conveying with a unit-load operation. It might be feasible to convey packages up into the building in instances where elevators are inadequate and there create unit loads on pallets or skids. From that point on the advantages of unit load handling would be secured. In making this statement we are not overlooking the important principle of unit-load handling, namely, that the best results are secured when the unit load is created as the first step in the handling cycle and bulk is broken as the last operation. We are here discussing what can be done when these ideal conditions cannot be met.

Of course, there are certain physical conditions which must obtain in order to convey materials into a cold storage building. It has been found impractical to run conveyors between floors in refrigerated areas, especially if the rooms are held at widely varying temperatures. The floors are unusually thick and it is difficult to devise a practical means of insulation at the openings in floors.

Layout Affects

When, however, the layout is such that unrefrigerated passageways are sufficiently wide and so located with reference to each other that conveyors can be used, they offer an opportunity to permit the application of this type of handling. We are, of course, speaking here of the advanced type of conveying systems, many of which can be run under ceilings where they are out of the way and so do not interfere with traffic flow.

Gravity Conveyors

A brief review of some of the changes and improvements made in conveying equipment will show how much more adaptable and flexible they have become. Take gravity conveyors, for instance. One of the greatest drawbacks to the use of this equipment in car and truck operations was the necessity of laying additional sections as the work progressed into the carrier. There are now several kinds of wheel and roller conveyors which are telescopic.

One type is so constructed that the different sections are nested under each other and additional length is secured by pulling them out. The other type is built on the accordion principle, but has the disadvantage of changing the distance between the rollers as the unit is extended.

Of course, gravity conveyors are limited in their application because they require pitch, so that if the run is a long one some type of "booster" must be injected in the line to restore elevation. Another limitation is due to the non-reversibility of the line. In most instances this means that if both in and out flow is required two independent setups must be provided. On the other hand completely powered conveyor systems can be easily made to function in both directions as required.

Other Types of Conveyors

Except for the fact that they are reversible, live roller conveyors do not offer many advantages over the gravity types for the long run of warehouse handling. Powered belt conveyors of various types can move a greater variety of products and even when not equipped with cleats can be used to elevate at steeper inclines than power driven rollers.

But there are many other kinds to be investigated. Pusher bar, apron and flight conveyors all have their use under certain kinds of operating conditions. Then there are many types of chain conveyors. Some of these are so flexible that they can operate up and down inclines and around turns as great as 180 degrees and still be driven by a single power unit.

Naturally, it would be foolish to say that conveyors can solve every handling problem for the warehouseman who cannot palletize his loads, but he should not overlook their possibile application to his particular conditions by calling in the representatives of manufacturers who specializing in making this type of equipment.

Improved Manual Equipment

And, finally, what can be done to reduce costs if none of the methods suggested here can be utilized. Well, there is only one thing left to do and that is to investigate the improvements which have been made in manual handling equipment itself. Many of our old friends in the handling field have been mechanized. Even the humble stevedore type of truck has been brought into the powered field by the addition of a motor. Dockboards have been made of lighter materials and adjustable models are now available. There are better warehouse trucks of every variety available today than ever before.

After all, it matters little how costs are reduced, so long as they are reduced and the warehouseman who wants to cut his handling costs must be willing to investigate any and all possibilities. If he gives his men the best currently available working tools he may be sure that he is doing all he can to secure the best from his operations. So, if he can, let him palletize or if he can't let him use the skid system or tie-in with conveying. If all these fail, let him give his men the advantage of working with the most improved type of manual equipment.

Report of Studies of Cheese Mite Control

THE project at University of Wisconsin on cheese mites and means of control is following up some promising leads, according to a recent bulletin of the Refrigeration Research Foundation. For example, gelatin has been employed successfully to reduce surface tension on waxed cheese blocks and to promote deep penetration of Dowicide A aqueous suspension. A four percent suspension of Dowicide A has been found effective during a period of two weeks following dipping, with T. farinae used as the test species of mites.

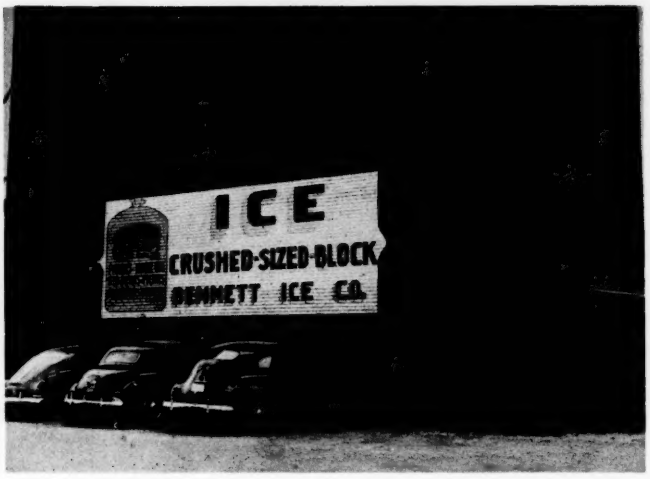
Tests are under way to determine the minimum concentration of Dowicide A for control of mites and eggs. Other wetting agents have been compared with gelatin, and control of humidity in the mite environment has been studied in a preliminary way. It looks as if control of humidity may become a weapon against mites, but further study will be necessary. Glycerine will be studied as a wash for use in chemical methods, and the humidity studies will be continued. The phases dealing with Dowicide A will probably be published soon.

PUT YOUR SIGN ON YOUR BUILDING

SOMETHING people see every day of the week and which makes a definitely favorable impression upon them, can influence their future buying. This is demonstrated daily by the promotional effort of such things as national billboard advertising, spectacular signs and even the Burma Shave roadside signs.

All of these cost a good deal of money and are beyond the budget of the average ice manufacturer. But he has, in the vast majority of cases, an opportunity to accomplish the same effective business building and at very little cost.

Yes, it's in letting your building sell for you. The majority of ice manufacturers are located so that one or both sides of their building are open in full view of passing motorists. Most of the time this building carries a simple identification sign and in some instances we have observed has been sold to a bottler or brewer for advertising purposes. If it is so profitable to the bottler or brewer it can be equally profitable to the ice manufacturer as well.



Here's how the Bennett Ice Company, Ottawa, Kansas, does a selling job with large sign on side wall of its ice plant building.

Ice Sign Tells a Story

In the accompanying illustration is shown how one mid-western firm lets the side of its building do a selling job. It's the Bennett Ice Company at Ottawa, Kansas. With an inexpensive sign the firm has created a business promotion that is working for it every day of the week.

As can be noted the sign does a complete job by pushing the main service as well as the special features of the company's production. The local resident who passes by every day on his or her way to town cannot help but notice the sign and eventually absorb every word it presents. Naturally when his need for what the Bennett Ice Company has to offer arises his subconscious mind will very forcefully recall the sign and everything it stated.

Most firms keep the cost of such signs at a minimum by avoiding the use of big illustrations but some have found this extra expenditure worthwhile. Others have found that using a small picture and a limited number of words, has been more effective from a dollar and cents standpoint than the most expensive venture. The latter is justified, however, in instances where one has a very competitive situation and something must be done to make ones sign stand out.

One factor of importance in such signs is not to attempt to say too much, for generally the passer-by has only a few brief seconds for even a part of the building sign to register with him. Covering the whole side of a building has generally been found to produce less results than using a small section up front such as in the example shown here.

The actual ideas themselves should also be presented in the fewest possible number of words and also with the shortest words that can be used and the desired effect still obtained. Again, it's a matter of the few seconds the passer by has in which to absorb the idea.

Along the same path it is also desirable to confine the thought to a single short line rather than a number of lines or a long sentence. Always we must keep in mind how short a period of time (actually only seconds) the passer by has in which to absorb what we have to say to him.

Colors Should Contrast

The choice of colors used in such signs is also of importance for an effect of making the message stand out and be easy to read is also necessary. Color combinations which lend themselves to good visability will give assurance that the sign can be read from a greater distance and thus the prospect will have more time in which to read what we have to say. The Bennett Ice sign has a white background with the word "Ice" in red, others in black lettering, the bag in yellow with blue and red lettering. Black on a yellow background also has easy readability and can be seen from a distance.

In choosing color combinations for such selling signs it is wise to select those having greatest contrast. Colors which blend into one another or which may be in attractive pastel shades are more beautiful to look at but their effect in this use is very low.

It is also of much importance to see that the name and telephone number of one's firm stands out. This is very good procedure if we have an easy to remember telephone number. If it is otherwise, then we should concentrate on the firm name.

The person who has a sudden need for our services can remember "that company on West Main street" but if we have one or more competitors on the same street one of these competitors is very apt to get the call.

On the other hand if the individual as definitely remembers our firm name, and better yet, the telephone number, we have an almost certain chance of getting the business this building sign of ours has thus made it possible for us to secure.

No matter how many advertising or promotional methods we may use no one can be all inclusive and reach

(Continued on page 51)

Amonia Damage to Stored Fruits and Nuts Sulfur Dioxide As a Corrective Treatment

D. H. DEWEY
Associate Plant Physiologist
Bureau of Plant Industry, Soils and Agricultural Engineering, United States Department of Agriculture

AMMONIA escaping from refrigeration systems is always a hazard, especially where direct expansion systems are employed for the storage of perishables. The damage suffered by many fruits and nuts from exposure to ammonia fumes has not been clearly described and methods to counteract the damage have not been studied. The symptoms of ammonia injury on apples, pears, bananas, peaches and onions were described and illustrated in color by Ramsey and Butler (5) in 1928. Ammonia also has been reported to cause injury to pecans (2), and other kinds of nuts are known to be similarly damaged, giving rise to the precaution of avoiding storage of nuts in refrigerated warehouses employing direct expansion ammonia systems.

Ammonia gas is toxic to human beings, but it is not considered highly dangerous because of its strong distinctive odor detectable at a minimum concentration of 53 ppm. The physiological responses of human beings to ammonia have been reviewed by McNally (3), who stated that approximately 400 ppm causes throat irritation and 700 ppm immediate irritation of the eyes. Coughing results from a concentration of ammonia of approximately 1,700 ppm and exposure to 2,500 to 4,500 ppm for one-half hour may be dangerous to life. Even short exposures to concentrations of 5,000 to 10,000 are considered to be rapidly fatal.

Wide Tolerance to Ammonia

Plants and plant parts vary widely in their tolerance to ammonia. An ammonia concentration of 0.8 per cent (or 8,000 ppm), employed by Ramsey and Butler (5), caused injury within an hour to apples, pears, bananas, peaches and onions. The tolerance of living plants and of seeds to ammonia was investigated at the Boyce Thompson Institute and at a concentration of 0.1 per cent (1,000 ppm) the leaves of tomato, buckwheat and tobacco were seriously injured in 3 to 8 minutes. The stems, being more tolerant than the leaves, were not seriously injured unless they were exposed for as much as 4 hours (6).

The germination of rye and radish seeds was used as a guide to injury from ammonia. Dry seeds exposed to 1,000 ppm were not greatly affected, but moist rye and radish seeds were killed in 4 and 16 hours respectively, when exposed to the same concentration of gas (1). The observations of J. G. Woodroof at the Georgia Agricultural Experiment Station[1] showed that concentrations of ammonia barely detectable by odor in a cold storage room caused darkening of the skins of pecan meats. Obviously, the susceptibility of various commodities to injury by ammonia varies greatly and injury may be very serious on some.

Reaction of Ammonia

Ammonia is chemically reactive. It reacts readily with sulfur dioxide, chlorine, bromine and iodine and at a slower rate with carbon dioxide and formaldehyde. Its chemical activity has suggested the use of these compounds to neutralize escaping ammonia and to decrease damage caused by the ammonia. Chlorine, bromine and iodine are entirely unsuitable for this purpose, however, because they form explosive compounds when they react with ammonia. The ammonia-carbon dioxide reaction, in addition to being relatively slow, yields compounds with a strong ammonia odor and their presence as a residue on horticultural products would be undesirable. The reaction of formaldehyde and ammonia produces an odorless and colorless powder, but it probably occurs too slowly at cold storage temperatures for formaldehyde to be of importance as a neutralizing agent for ammonia escaping from a refrigeration system.

Sulfur dioxide would seem to be a logical material for use in rooms containing horticultural products since it is widely used as a fungicide for stored grapes. The uses and limitations of sulfur dioxide for this purpose have been reviewed by Pentzer (4). Sulfur dioxide is utilized also as a bleaching agent in the commercial processing of unshelled almonds and filberts for the fresh market.

The reaction of sulfur dioxide and ammonia takes place in two steps, the first of which yields ammonium sulfite. This compound reacts further with sulfur dioxide to yield ammonium bisulfite. The sulfite and bisulfite compounds are colorless or whitish crystals. Approximately four pounds of sulfur dioxide will neutralize one pound of ammonia. The first step in the reaction requires half this amount of sulfur dioxide and theoretically this quantity should remove all of the free ammonia from the atmosphere. Water is required for both steps of the reaction and would be taken from the storage room atmosphere and from the stored commodities unless otherwise supplied.

Experimental Methods And Results

The primary objectives of the studies reported in this paper were (a) to determine the concentration of ammonia gas causing damage to a number of commodities held at cold storage temperatures, (b) to describe the symptoms of ammonia injury and to record them by color photographs whenever possible and (c) to study means of preventing or counteracting the damage with primary emphasis on the use of sulfur dioxide gas. The general plan of study was first to expose the commodities to various concentrations of ammonia at 35F. and to relative humidities of 65 to 75 per cent. The quantity of sulfur dioxide required for the first reaction with ammonia was then added to the atmosphere and generally held one-half hour. When beneficial results were obtained the quantity of sulfur dioxide needed to complete the expected chemical reaction with ammonia was then added. Higher temperatures and longer exposures to ammonia and sulfur dioxide were frequently employed when further testing was desirable.

The tree fruits and vinifera grapes employed in these tests were obtained at the packing shed or at the orchard or vineyard and were of commercial grade and quality. The tree nuts and peanuts were obtained on the local market. They were not identified as to variety and the previous processing and handling treat-

Report of studies conducted by the Division of Handling, Transportation, and Storage of Horticultural Crops at Frenso, California, under the general direction of A. Lloyd Ryall. Financial assistance was given by The Refrigeration Research Foundation.

[1] Reported in The Refrigeration Research Foundation Bul. 52 (1) 1952. The Refrigeration Research Foundation, Colorado Springs, Colorado.

ments could not be ascertained. All nuts were treated in the shell.

The results of the ammonia and sulfur dioxide treatments are summarized in Tables 1 to 3. The concentrations causing damage were extremely variable, varieties as well as kinds of commodities differing in susceptibility. It would be extremely difficult to anticipate the concentrations of ammonia one would encounter in a storage room in which there was a major break in the refrigeration system, but serious damage to most commodities would probably result within a short period, especially near the source of escaping ammonia. Minute leaks of ammonia would not seem to be a serious hazard to most products if good ventilation could be quickly provided.

The principal symptom of ammonia injury on fresh fruits was an immediate development of a deep blue color. The red-colored portions of fruits, such as the blush on peaches, turned blue and the green portions of the fruit often developed slight bluing upon exposure to ammonia gas. The latter was exemplified by the bluing of the stems and capstems of grapes and frequently of areas of nectarine and peach fruits which showed no previous reddening or blush.

The symptoms of ammonia injury on cherries, Santa Rosa plums and pears occurred around the lenticels, whereas on peaches and nectarines they were not confined to any particular area of the fruit surface. The berries of grapes turned bluish primarily around the capstem attachment and at punctures or breaks in the epidermis of the fruit. Grape stems became blue at scattered areas, especially at breaks or wounds, whereas the capstems were generally completely discolored dark blue or black. Permanent damage to fruit and stem tissues was evidenced by browning and shriveling but sometimes these were not apparent until the blue color had disappeared.

Browning of the shells and outer coverings of the nut meats was the primary symptom of ammonia in-

TABLE 1—SUMMATION OF THE EFFECTS OF AMMONIA GAS AND CORRECTIVE TREATMENT WITH SULFUR DIOXIDE ON STORED TREE FRUITS

Kind and variety	Minimum ammonia exposure causing injury	Description of ammonia injury	Effects of corrective treatment with sulfur dioxide
Sweet Cherry: Black Tartarian	1,000 ppm for ½ hr. at 35F.	Dark blue color at fruit lenticels; no stem injury; gradual disappearance of discolorations.	Some reduction of blue discoloration; serious injury as pitting and bleaching.
Nectarine: John Rivers and Gower	1,000 ppm for ½ hr. at 35F.	Discoloration of blush from red to blue or black and sometimes discoloration of non-blushed areas. Blue color decreased with aeration, but surface tissues became brown and russeted after exposure to 3,000 ppm and higher concentrations.	Very slight reduction of blue color; small pits in epidermis after several days.
Plum: Santa Rosa	1,000 ppm for ½ hr. at 35F.	Lenticels swollen and discolored dark blue on red fruit and became sunken and brown after several days.	Very slight reduction of blue color. Sunken and bleached lenticels and lesions evident after several days.
Plum: Wickson		No injury at maximum concentration (10,000 ppm) for ½ hr. at 35F.	Not injured by corrective treatment.
Peach: Elberta	3,000 ppm for ½ hr. at 35F.	Blue or black discoloration at blush and sometimes at non-reddened areas. Discoloration reduced by aeration, but permanent damage as browning evident after several days.	Blue discoloration slightly relieved; browning increased and sunken and browned cavities sometimes developed at fruit surface.
Pear: Bartlett	10,000 ppm for ½ hr. at 35F.	No immediate injury; lenticels discolored dark blue and became brown after several days at 70F. No effect on ripening behavior.	Sunken and bleached lesions evident after several days; lenticel discoloration not corrected.

TABLE 2—SUMMATION OF THE EFFECTS OF AMMONIA GAS AND CORRECTIVE TREATMENT WITH SULFUR DIOXIDE GAS ON STORED VINIFERA GRAPES

Variety	Minimum ammonia exposure causing injury	Description of ammonia injury	Effects of corrective treatment with sulfur dioxide
Cardinal	5,000 ppm for ½ hr. at 35F. (immediate fruit and stem injury).	Immediate injury appeared as dark blue discolorations at scattered areas on stems, on capstems and on berries around capstem attachment. Berries also became blue in color around skin punctures and breaks; red berries showed complete slight darkening only upon long exposure to high concentrations. Blue coloration disappeared naturally from stems and capstems in several days, but these areas became brown and pitted. Aeration yielded only slight natural dissipation of berry discolorations.	Amounts necessary for complete neutralization of ammonia somewhat removed immediate symptoms of injury, but did not prevent browning of stems and capstems. Gassing with .25 per cent after neutralization or aeration of ammonia reduced discolorations; 1 per cent bleached stem tissues excessively and removed practically all blue discolorations from berries. Sulfur dioxide did not prevent shriveling and pitting of stems.
Thompson Seedless (Sultanina)	10,000 ppm for 1 hr. at 35F. (no fruit injury, stem injury evident after one day).		
Black Monukka	10,000 ppm for 1 hr. at 35F. (immediate fruit and stem injury).		
Flame Tokay	10,000 ppm for 1 hr. at 35F. (immediate fruit and stem injury).		
Emperor	20,000 ppm for ½ hr. at 35F. (no fruit injury, immediate injury to stems).		

TABLE 3—SUMMATION OF THE EFFECTS OF AMMONIA GAS AND CORRECTIVE TREATMENT WITH SULFUR DIOXIDE GAS ON UNSHELLED TREE NUTS AND PEANUTS

Kind	Minimum ammonia exposure causing injury	Description of ammonia injury	Effects of corrective treatment with sulfur dioxide
Almond	10,000 ppm for ½ hr. at 35F. injured shells immediately; meats showed injury after 1 week. Immediate damage to meats caused by 10,000 ppm for 68 hrs. at 70F. and 50,000 ppm for 24 hrs. at 35F., but not by 100,000 ppm applied ½ hr. at 70F.	Discoloration of shells and integument of meats to darker shades of brown; shells became reddish-brown or rusty color, integuments dark brown. Internal color of meats and flavor not affected. Little or no change in shell color after treatment, but integuments generally became darker.	Original color of shells and meat integuments restored by sulfur dioxide. Excess quantities, up to 5% for 2 hrs., applied immediately or 1 week after ammonia treatment, not harmful. Best results obtained by removing ammonia fumes by aeration prior to corrective treatment.
Filbert	10,000 ppm for ½ hr. at 35F. injured shells; 40,000 ppm for ½ hr. at 35F. and 10,000 ppm for 68 hrs. at 70F. injured meats.	Shells discolored to darker shades of brown by strongest concentrations and longest exposures, and became almost black. Integument of meats darkened to dull, chocolate-brown color; color and flavor of flesh not affected. Discolorations not reduced by aeration.	Original color of shells and integuments restored by excess quantities of sulfur dioxide applied immediately or 1 week after ammonia treatment, Flavor of meats not impaired. Best results by first aerating. 5% was maximum concentration employed.
Persian Walnut	40,000 ppm for ½ hr. at 35F. injured shells. Meats developed injury in storage following exposure to 100,000 ppm for ½ hr. at 65F.; immediately injured by 100,000 ppm for 6 hrs. at 70F.	Shells discolored to slightly darker shades of brown. Integument of meats discolored to darker shades of brown or to black by 12-hour or longer exposures to 100,000 ppm at 70F. Flesh color and flavor of meats not affected. No change in shell color after treatment; integuments generally became darker in color.	Immediate or delayed corrective treatment usually restored original color of shells and meats but sometimes produced undesirable colors by excessive bleaching. Best results obtained by aeration prior to application of sulfur dioxide. Meats became rancid from sulfur dioxide with or without prior exposure to ammonia.
Pecan	Minimum treatment tested (50,000 ppm for 24 hrs. at 35F.) slightly injured the shells and seriously injured the meats.	Shells with scattered areas discolored dark brown; meat integuments discolored to a dark, dull brown color; spongy internal shell changed from reddish-brown to black. Flesh color and flavor of meats not affected. No color changes upon aeration.	5% applied for 2 hrs. after aerating did not restore original color of internal parts; 5% applied for 8 hrs. restored internal color, but bleached shells to undesirable yellowish shade. No off-flavors after one month at 40F., but rancid after another month at 70F.
Peanut, Virginia type, (raw and roasted)	20,000 ppm for ½ hr. at 35F. injured pods and seeds.	Pods slightly darkened. Seed coat discolored to dark shades of brown; discoloration considerably dissipated upon holding in atmosphere free of ammonia. No off-flavors.	Pods bleached, but seed coverings not fully restored to original color. No off-flavors developed in one month at cold storage or room temperatures.

jury to almonds, walnuts, filberts and pecans. The color changes caused by ammonia were from light to darker shades of brown, and the blue discolorations generally characteristic on fresh fruits were not observed on nuts. Aeration of the nuts following exposure to ammonia generally had little or no effect on the discolorations. Flavor and keeping quality, however, were not seriously impaired by ammonia vapors.

Ramsey and Butler (5) suggested that the color changes in fresh fruits and onions caused by exposure to ammonia are associated with pH changes of the cell sap. More recent studies by Thornton and Setterstrom (6) demonstrated that the pH of the tissues of living plants may be markedly changed by exposure to ammonia vapors. The development of shades of blue in various fruits in these tests are probably due to the color changes of the anthocyanins as the cell sap became less acid in the presence of ammonia. The original pH of the living cells would probably be restored upon removal from the ammonia atmosphere and this would account for the gradual disappearance of the symptoms of ammonia injury noted particularly in cherries and peaches. Permanent damage to the tissues by ammonia would result in the browning which sometimes appeared several days after exposure to ammonia. The nature of the color changes in nuts caused by ammonia is not known.

Neutralizing Agent

The value of sulfur dioxide as a neutralizing agent for ammonia or as an antidote for ammonia injury is largely dependent upon the tolerance of the commodity to sulfur dioxide. This gas caused pitting and bleaching injury of most fruits and the development of off-flavors and rancidity in walnut and pecan meats. Sulfur dioxide would tend to acidify the cell sap and thereby reduce the discolorations caused by ammonia; however, its primary value seemed to be due to its properties as a bleaching agent. This effect was observed on the shells and outer coverings of the meats of nuts and on the stems and capstems of grapes.

The tests demonstrated that ammonia gas may be readily removed from a storage room atmosphere by the introduction of sulfur dioxide gas. The reaction of these two gases is familiar to storage operators because it is widely used in the detection of ammonia leaks. A white fog or cloud is produced when burning sulfur sticks, tapers or candles are held near the source of escaping ammonia gas. The white precipitate produced by this reaction may be deposited on the stored commodities and containers, and in fact, wherever the reaction occurs. This residue could be a serious disadvantage when sulfur dioxide is used as a neutralizing agent in storage rooms. Furthermore, since the reaction takes place in two steps and is dependent upon the presence of water vapor, it would be extremely difficult to estimate the amount of sulfur dioxide to supply to a storage atmosphere contaminated with ammonia and the rate at which to supply it.

Sulfur dioxide served as a satisfactory neutralizing agent for ammonia in these tests only for commodities tolerant to sulfur dioxide. Even for these products it would seem desirable first to clear the atmosphere of ammonia and then to supply sulfur dioxide to remove or reduce the discolorations caused by ammonia, for in this manner the undesirable products of the ammonia-sulfur dioxide reaction would be avoided. The ammonia could be flushed from the storage atmosphere by aeration or possibly with water since ammonia is extremely soluble in water even at cold storage temperatures. Where drainage facilities and construction permit, large amounts of ammonia could be removed by flooding with water or, in other cases, by using an air washer utilizing water as the absorbent.

Nuts, peanuts and Emperor grapes previously damaged by ammonia were also treated with gaseous formaldehyde and carbon dioxide as correctives. Neither of these gases was of value in reducing the discolorations caused by ammonia.

Recommendations

The best means of removing ammonia fumes from storage rooms are aeration and washing the contaminated atmosphere with water. Unfortunately these methods are not always practical because many storages are not ventilated or equipped with air washers. It may then be feasible to employ sulfur dioxide to neutralize the ammonia gas provided the commodities in the storage room are resistant to damage by sulfur dioxide.

In the experiments conducted, only grapes, almonds and filberts withstood the corrective treatment with sulfur dioxide. The concentrations of sulfur dioxide normally employed for the commercial treatment of these commodities should never be exceeded when the gas is used to neutralize the ammonia or to correct the damage caused by exposure to it. Concentrations of not over 1 per cent sulfur dioxide are used for fumigating grapes while concentrations of approximately 5 per cent are used for bleaching unshelled almonds and filberts.

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Irradiation of Foods

RESEARCH of use of radiations in the processing of foods is only beginning and we can expect various kinds of discoveries to be made in the course of such studies, says a recent bulletin of the Refrigeration Research Foundation. A recent report states that X-Ray irradiation is dangerous to foods because it damages fatty acids and vitamins and releases dangerous peroxides. The source is reported to be Dr. J. F. Mead of University of Calif. in Los Angeles, working in the Atomic Energy Project. The director has repeatedly said that the extensive commercial irradiation of foods is still a long way off. Years of work still have to be done to prove its technological and economic practicability.

Dalton Asks for Plank On Small Business

A STRONG bid for Democratic and Republican Party support of a plank favoring encouragement of the nation's small businesses was made by the National Association of Refrigerated Warehouses through its executive vice president, William Dalton.

In telegrams addressed to the parties' platform committees at their pre-convention sessions in Chicago, NARW urged them to go on record as favoring a constructive program protecting the interests of America's millions of small businesses.

Mr. Dalton stated that the position of small business in the national economy must be maintained and protected because of the substantial contribution to material prosperity which small business makes. It must be protected from unfair trade practices, he said; must have better and more effective representation through committees of Congress; must be freed from the restrictions caused by unfair tax practices; and must be given a greater voice in the affairs of governmental agencies which regulate business.

All these factors, Mr. Dalton concluded, constitute reasons for political parties to pledge themselves to the protection of small business.

Beatrice Foods Builds New Refrigerated Warehouse

A NEW type of mechanical refrigerrefrigerated warehouse adjacent to the Stockyards district of Denver, Colo., is being built by the Beatrice Foods Company. Designed primarily to quick-freeze and store meat and poultry for the fast growing Denver area, the new warehouse will be a single story building, 228 by 115.

More than 100,000 pounds of meat and poultry will pass through the quick-freezing tunnels of the new plant every few hours, according to Dan H. Murphy, manager of Beatrice cold storage operations. With a temperature range of minus 10 to minus 40 degrees, the warehouse will double the capacity of Beatrice Foods Company's present refrigerated storage facilities in Denver. According to Beatrice vice-president Brown W. Cannon, the new plant will handle $50 million worth of perishables annually.

In addition to quick-freezing and storing meat and poultry the new Beatrice warehouse will store other types of perishable food products. It is expected to be an important asset to frozen foods production and distribution in the Rocky Mountain region.

Architect's drawing of new Beatrice Foods Warehouse

THE ICE INDUSTRY

NATIONAL ASSOCIATION OF ICE INDUSTRIES

Executive Offices
1706 L St. N. W., Washington 6, D. C.

Executive Secretary
Guy W. Jacobs, Washington, D. C.

President
Wm. J. Ayers, Memphis, Tenn.

First Vice-president
Paul H. Andres, Oklahoma City, Okla.

Second Vice-president
E. L. Gunn Jr., Atlanta, Ga.

Treasurer
Geo. Steers, Jr., Kalamazoo, Mich.

THIS MONTH IN BRIEF

The 35th annual convention of the National Association of Ice Industries will be held at Cincinnati, Ohio November 11 to 14. With its hotel facilities and easy accessibility, Cincinnati is expected to attract a record number of ice men and visitors.

The Board of Directors of the National Association of Ice Industries held a meeting at Cincinnati July 29 and 30 to discuss preliminary plans for the annual convention and to transact other association business.

Joining the ranks of other meat packers, Armour and Company offers promise of being an important factor in popularizing the use of crushed ice for dressed poultry. Merchandising and sales helps will be available to retailers, which will afford many ice men an opportunity to widen their sales of crushed ice.

A new modern plant for the manufacture of ice has been constructed in Calgary, Alta., Canada by the Alberta Ice Company, Ltd. It has an ice making capacity of 80 tons per day.

1952 Ice Convention at Cincinnati, Nov. 11-14

THE 35th annual convention of the National Association of Ice Industries will be held at the Netherland Plaza Hotel, Cincinnati, Ohio, Tuesday to Thursday, November 11 to 14. At Cincinnati was held the first ice convention in 1918, and this will mark the association's initial homecoming.

With a reputation as a leading convention city, Cincinnati is within overnight distance of more people than any other metropolis in the country. Within a 400 mile radius are 40 percent of the total population of the United States. This city is served by eight major railroads and five principal airlines and a

Front View of the Netherland Plaza Hotel With Adjoining Carew Tower

broad network of arterial highways makes it easily accessible by automobile.

Hotel Facilities

The city also is favored with excellent hotel facilities. The Netherland Plaza, convention headquarters, is one of America's handsomest hotels, right in the heart of the city, 29 stories high with 800 outside rooms. The convention area, located on the fourth floor, has 36,000 square feet, including two ballrooms, capable of accommodating 1,200 people. One of these, the Hall of Mirrors, has been assigned for the ice convention sessions. The adjoining north and south halls provide 10,000 sq. ft. of exhibit space equipped with all utility connections. A foyer in front of these main rooms furnishes space for convention headquarters, registration desks and news bureaus. A row of dining rooms on the same floor makes it possible to serve guests up to 250. All meeting rooms, restaurants, lobbies and lounges are air conditioned.

Overlooking Fountain Square, the Netherland Plaza is at the hub of Cincinnati. Most of the city's important stores, theaters and office buildings are within easy walking distance.

There are four quality restaurants and two cocktail lounges. The Carew Tower garage with space for 400 cars adjoins the hotel, and there is an entrance to the hotel direct from the garage. An arcade leads to department stores and shops.

Among the places visitors will find well worth visiting in Cincinnati are Eden Park with its lofty views of the river and neighboring Kentucky, Rookwood Pottery, the Cincinnati Zoo, the 41 million dollar Union Terminal and the river front harbor. A few miles up the river is Coney Island amusement park, fun headquarters of all of southwest Ohio.

Board of Directors Meets in Cincinnati

THE board of directors of the National Association of Ice Industries held a meeting at the Netherland Plaza Hotel, Cincinnati, July 29 and 30. The meeting was preceded by one of the hottest days on record, and with iceman's weather as a background, an enthusiastic session was held. Many ideas with profit potentialities were circulated among the members.

Chief business transacted was discussion of preliminary plans for the 35th annual convention to be held at the Netherland Plaza November 11-14. These plans will all be formulated and the details announced later.

Reports were presented by Guy W. Jacobs, executive secretary, and the three department heads. In later discussion many practical suggestions for increasing ice sales were brought forth. These ideas were considered of such practical value that they will be listed and reported to the membership of the association.

Attending the meeting as a special guest was Mount Taylor, former executive secretary.

Convention Program

The convention program will be made up of practical and useful information for every iceman. There will be an abundance of reports on trends and developments, research findings and merchandising ideas that will mean better business for progressive ice companies. As usual, according to the program committee, the leading icemen of the country will be on hand to analyze the present status of the industry and the immediate future outlook. There will also be many prominent guest speakers from other firms.

Board of Directors in Session at Cincinnati: Left table: T. J. Beck, Chicago, R. C. Muckerman, St. Louis, F. X. Timmons, NAII, Walter B. Blessman, Akron, Esther C. Christiansen, NAII, George Steers, Kalamazoo (treasurer), W. T. Jobe, NAII, R. V. Sisk, Charlotte, N. C., H. L. Dithmer, Jr., Indianapolis, J. B. Mahoney, Charleston, S. C., R. F. Butler, Richmond, Va., M. J. Garvey, Jr., St. Joseph, Mo., J. R. Dean, Cape Girardeau, Mo. Rear table, left to right, William J. Lewis, Jr., Rochester, N. Y., Guy W. Jacobs, executive secretary N.A.I.I., William J. Ayers, Memphis (president). Paul H. Andres, Oklahoma City (first vice president). Seated at right table: George S. Sherrod, Greensboro, N. C., L. K. Davidson, Portland, Ore., H. J. Fairhead, Toronto, Ont., R. J. Schneider, Ranton, Wash., Mount Taylor, former executive secretary, NAII, E. L. Gunn, Jr., Atlanta (second vice president), D. J. Copeland, Richmond, Ky., J. C. Thompson, Dallas, E. L. Bennett, Somerville, Mass., Lee Gutierrez, Biloxi, Miss., C. P. Austin, NAII, Henry B. Nadorf, Denver.

Armour Promotes "Fresh-Iced" Chickens

JOINING the ranks of other meat packers, Armour and Co. gives promise of being a future factor in the promotion of crushed ice for the complete processing and the display of chicken. The Armour Company's position was announced in a two-page trade paper advertisement which has appeared in various grocery publications. This advertisement plays up ice as a chilling agent and means of protecting poultry quality.

Throughout the copy the term "fresh-iced" is very much in evidence. In one place the statement is made, "Armour Star Fresh-Iced Chickens come to you in crates with plenty of clean pure ice around them . . . These prize chickens are sped on their way to your market the same day in refrigerated trucks, while the bloom of the chickens is still at its peak."

Armour Fresh Iced Chickens—Note sign behind the counter publicizing ice.

Made Retroactive

Recently F. X. Timmons of the Public Information and Marketing Department of the National Association of Ice Industries visited George F. Snyder, merchandising manager, Armour Poultry Division, and Thomas Gordon, sales manager of the Dairy and Poultry Division, to discuss possible tie-ins with members of NAII. After hearing of the Ice Industry's cooperation with other poultry processors both gentlemen were convinced that a program of mutual benefit could be worked out.

Mr. Timmons pointed out that more could be done through merchandising if further emphasis was placed on the method of refrigeration. After the meeting there was considerable correspondence between Mr. Snyder and Mr. Timmons and Mr. Snyder expressed appreciation for the worthwhile information that had been offered by the National Ice Association.

He agreed with the idea that while Armour has talked about ice, perhaps his company had not exploited the idea from the standpoint of merchandising assistance and he intends to make ice a feature in Armour promotional material. Recently in a sales bulletin distributed to Armour salesmen in the San Francisco area Mr. McErlane, Armour representative in that area wrote, "Shipping chicken in ice has proved to be practical and very satisfactory in every respect. However, if the dealer will display these chickens on ice he will have much better success than by just displaying them in a dry refrigerator case."

Ice Association Helps

Mr. McErlane also pays tribute to the California Association of Ice Industries which offered to assist "more retail dealers to display poultry on ice." Ice companies in that section offered to deliver to a market free of charge for an initial icing of poultry.

A recent bulletin to all members from Mr. Snyder had this to say: "Your dealer friends must be told the story. It's a part of selling, merchandising assistance they call it — to persuade the dealer to give poultry more space in the case . . . Armour Star will have better quality . . . display it in ice. It will keep the bloom, reduce shrinkage and save dollars."

The company has issued an invitation to icemen to contact Armour representatives in every section of the country. They have been informed of the merchandising and selling possibility which can be gained through the cooperation of their local ice companies. Mr. Snyder says he has received many reports which indicate that Armour poultry salesmen who have established relations with ice companies.

Ice Publicity

WHEN the temperature hit 100 degrees F over much of the country late in July, F. X. Timmons sent a letter to UP correspondent Herman Nichols to let him know (with examples) that while everyone else was suffering, the iceman was ecstatically happy. Nichols happily seized on the thought as the subject of his next day's column. The lighthearted story about the joy of the iceman went out to several hundred United Press member papers and it is certain that numerous editors ran it. Nichols wrote a previous "Ice Column" last year at the time of the Houston convention.

Penny Ice Fund Campaign Brings in $5,000

THE twenty-second annual Indianapolis Star-Salvation Army Penny Ice Fund campaign was closed in Indianapolis, Ind., the latter part of July when contributions reached a heighth that will assure free ice for the city's needy for the rest of the summer. After the campaign had closed additional funds were received to bring the total to an even $5,000. This represents the largest amount ever contributed in the history of the Penny Ice Fund.

New Jersey Farm Uses Five Tons of Ice a Day for Sweet Corn

FIVE tons of ice a day! . . . that's the quantity one farmer used for the first commercial shipments of New Jersey sweet corn in iced corn bags. Previous experimental shipments showed that this icing at the farm level kept sugar in the corn from turning to starch while enroute to market.

Shipments made during the harvesting period averaged around 500 bags a day. Each bag carried 52 ears of corn plus 20 pounds of ice. A product of Union Bag and Paper Corporation, these iced corn bags are made from three layers of wet strength paper. A series of perforations in the bags act as drains for the melted ice water. As illustrated the corn packaging and icing operations are mechanized. The bags are then closed and placed in a refrigerated storeroom. Here they remain until shipped by trucks to chain store warehouses and wholesale markets and from there to consumer outlets.

New Nugget Ice

A NEW type of ice called "Reddy-ice," claimed to be a real money saver is announced from Dallas, Texas. The ice is made by a special machine in the form of nuggets, machine washed as they are made, and sold in water-proof bags at Cabell chain stores and independent stores.

Ice Prices Increased

RETAIL ice prices in Little Rock, Ark. were advanced 10 cents per 100 lbs early in August. Increased costs of production and distribution were listed as the reason for the increase in price by D. O. Blizzard of the Southern Ice Co.

—Photos furnished by Union Bag & Paper Corp.

Packaging sweet corn in iced corn bags. 1—The freshly harvested corn is brought in from the field and dumped into a receptacle outside the packing room. From here it travels by conveyor into the room where it is first inspected and graded. 2—Operators at each of the four bagging stations place the corn in the bags. Twenty pounds of ice are then placed on top of the corn. An overhead ice receptacle carries the crushed ice via chute direct to the bagging stations. 3—After the corn is packaged and iced the bags are wire tied and placed on pallet. 4—The pallet loads of bags are then placed in a refrigerated storeroom and are kept there until ready to be loaded into trucks for the trip to the market.

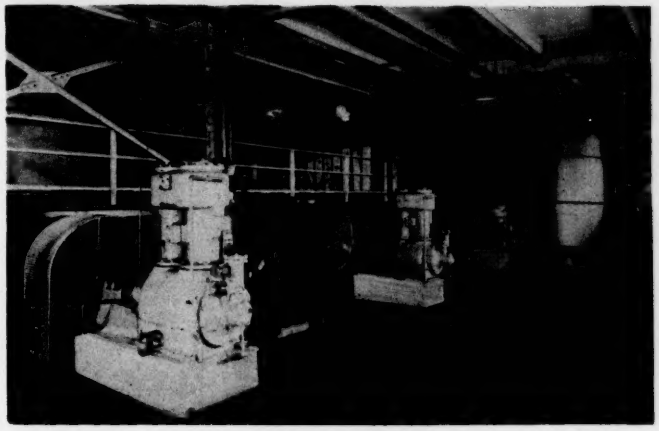
Canadian Ice Company Opens New Modern Ice Manufacturing Plant

A NEW modern plant for the manufacture of ice has been completed in Calgary, Alta., Canada, by the Alberta Ice Company, Ltd. Founded in Calgary in 1911, this company has faithfully served Calgarians, as well as Central and Southern Alberta and the interior of British Columbia, for more than forty years.

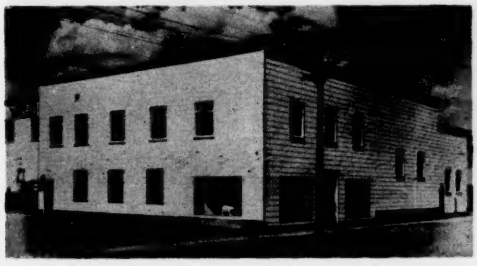
This new plant is recognized as the largest and most modern individual ice manufacturing plant in Canada, covering an area of 150 by 200 feet, and is built to adequately supply the steadily growing consumption of ice in its varied and diversified uses for the fast-growing city of Calgary.

Two-Story Building

The building is two stories high, with outside dimensions of 100 by 204 feet. The inside dimensions of the general office are 40 by 75 feet;



Machine room in new ice manufacturing plant of Alberta Ice Co. Ltd., equipped with York ammonia compressors and synchronous motors. Note large water filtering tank at right.

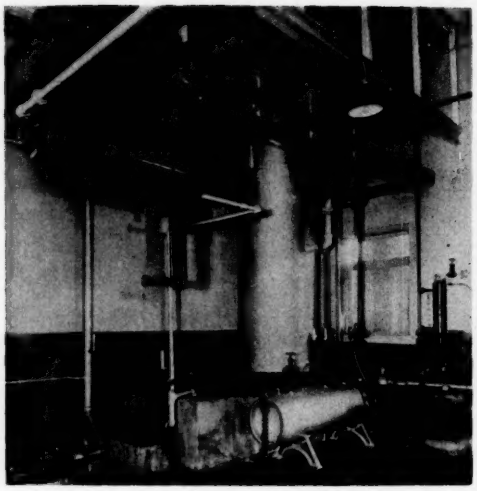


Partial exterior view of new ice manufacturing plant of Alberta Ice Co., Ltd., at Calgary. Note refrigerator show windows in corner of building.

Front of general office, Alberta Ice Co. Ltd.

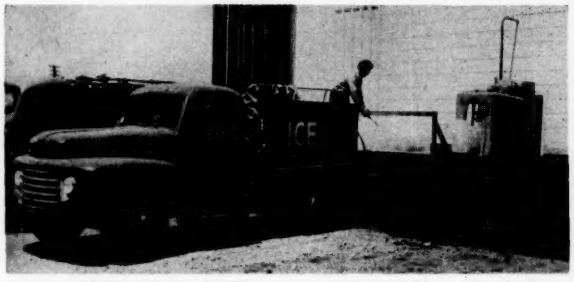
Refrigerated ice storage compartment

Ice crushing and sizing equipment



Ammonia condenser, receiver and water pump.

Ice-making tank room, Alberta Ice Co. Ltd.



Loading delivery truck. The ice scoring machine on platform divides a 300-lb. ice block into ten 30-lb. pieces for delivery

This ice vendor at 109 Tenth avenue is popular with ice customers in that section.

of the staff room 25 by 50 feet; equipment warehouse 20 by 82 feet; tank and machine room 56 by 89 feet; day storage 38 by 42 feet; permanent storage 30 by 74 feet; garage 57 by 76 feet. In addition there is a fully equipped suite and small office for the engineer in charge, as well as lockers, showers and toilets for the staff. The entire building is heavily insulated throughout. The exterior finish is of asbestos shingles, with a twenty year bonded built up roof.

Condenser

The condenser is a vertical shell and tube type, with water supplied by a Fairbanks-Morse deep well pump from the company's own well, at 300 gallons per minute. The water used for ice making is treated in a large settling tank, from where it is pumped through a three-bed filter to the can fillers.

Brine Tank

The brine tank is 31 by 61 feet on grade leve, containing sixty-two grids of fourteen 300-lb. cans each. The brine is cooled by a submerged herring bone coil completely flooded. A Sheppard four ton electric crane has been installed to handle the ice grids from the brine and dip tanks to the tipping table. The ice making capacity of the plant is rated at 80 tons per twenty-four hour operation. The ice storage room has a capacity storage of 200 tons of ice.

Ice Sizing

Near the service platform are ice crusher and ice sizing machines to process ice for meat and poultry refrigeration, vegetable icing, and party ice. These are of Gifford-Wood make. On the platform is a Uline ice scoring machine.

American Ice Report

THE American Ice Co. reports for quarter ended June 30, 1952 earnings of 23 cents per share on 416,235 shares, compared with 12 cents for same period of last year. Net profit after taxes were $122,247 compared to $76,630 last year. For six months ended June 30, net profits were $14,913 compared to net loss last year of $54,552.

Swimming Pool Uses Ice

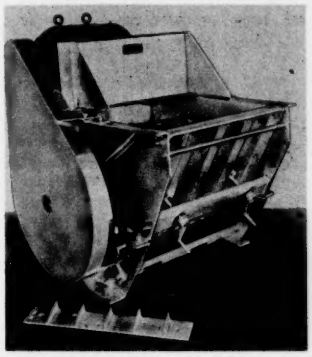
THE park commission, Niles, Ohio, on a hot day in July began adding ice to the water in the Waddell Park pool where swimmers were complaining that it was "too warm for comfort." Blocks of ice, weighing 300 pounds each were immersed in the pool until officials decided the water was cool enough for the swimmers.

Fishing Boats Use Ice—Bunkers Filled —100 Tons Per Hour

THE Fort Wharf Ice Company, Gloucester, Mass., delivers ice to the bunkers of fishing boats at rates exceeding 100 tons per hour. This high-speed operation enables boats to "ice up" and put to sea in a minimum amount of time, an important dollars-and-cents factor when the fish are "running." The fast delivery also enables the company to service many boats in a short time and on short notice.

Ice Conveyed by Chutes

As shown in the illustration, ice is conveyed by long chutes from ice breaking equipment to the ice bunkers. Two Gifford-Wood ice breakers, each of 50-tons-per-hour capacity, break the ice as it is fed to them in the form of 300 lb. cakes. A 24-in.-diameter drum, to which are secured 24 picks, rotates at 75 to 125 rpm to break the ice as it enters the machine. A third ice breaker (not shown) is equipped with a "flaker" for producing very small particles for packing fish which might be damaged by larger pieces.



This ice breaking machine breaks more than 50 tons of ice per hour.

With this equipment, twenty tons of ice can be broken and loaded into trucks for delivery to local fish houses and packers, or the crushed ice can be fed into boats tied up at pier as shown in the illustration below.

A smaller Gifford-Wood ice breaker, of 20-tons-per-hour capacity, breaks ice for highway-truck delivery to local fish houses and packers.

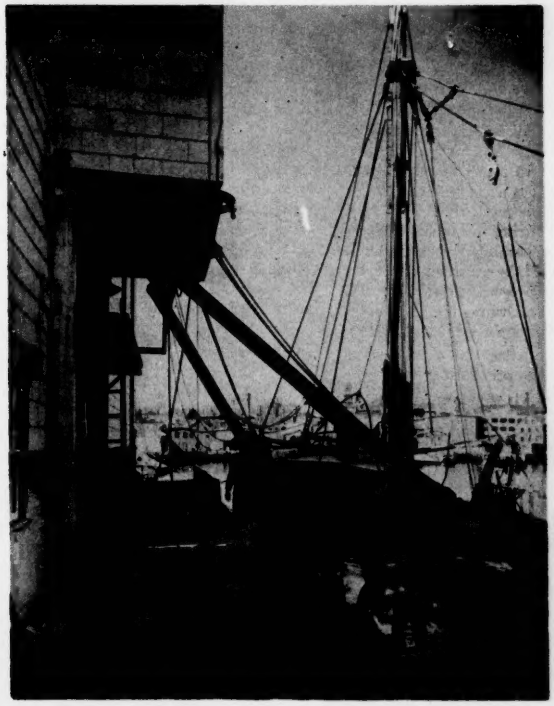
The Ice Industry

Exhibit at State Fair Shows Poultry on Ice

THE Missouri Valley Ice Manufacturers Association, in cooperation with the Missouri Poultry Council, Missouri Poultry Improvement Association, Missouri Turkey Federation and the Extension Service of the University of Missouri, sponsored an exhibit at the Missouri State Fair in Sedalia, Mo., August 16-24. This display featured chickens and turkeys on ice, and chickens and turkeys by the piece on ice.

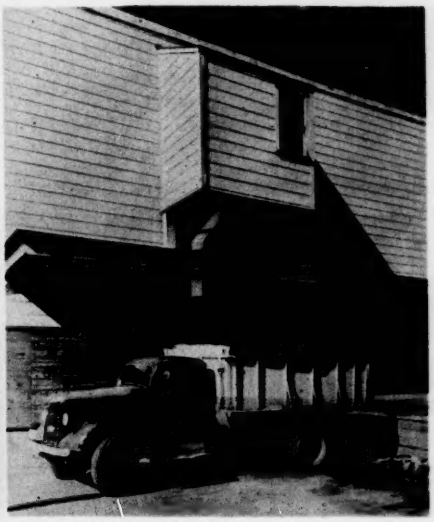
Salary Increases Made Retroactive

THE Salary Stabilization Board has authorized approval by its staff of salary increases retroactive to the effective date of wage boosts granted by the same employer and approved by the Wage Stabilization Board. Previously, such salary increases under General Salary Order No. 6 could not be made retroactive beyond the date of the wage board approval of the wage increase.



Left: Fort Wharf Ice Company, Gloucester, Mass. fills ice bunkers of fishing boats at high speed to enable boats to return at sea with minimum loss of time.

Below: Twenty tons of ice can be broken per hour and loaded into trucks for delivery to local fish houses and packers.



Reports from Unit Ice Associations

Florida Ice Association

MURIEL WASHBURN

THE annual convention of the Florida Ice Association will be held at the Hotel Floridan, Tampa, October 12-14, 1952. This was decided at a recent meeting of the board of directors.

This year's convention will be opened with a new feature, a golf tournament, starting Sunday, October 12. A committee headed by Jimmy McLemere will arrange handicaps, and prizes will be awarded at the welcome party starting at 6:00 p. m. Sunday. Tampa ice manufacturers and their ladies, noted for their wonderful hospitality, will be hosts at this party which gives promise of being one of the highlights of the meeting.

The program committee, recognizing the increasingly rapid changes that are taking place in the ice industry today, have made plans to secure authorities to cover the most important developments and trends in the 1952-53 ice market. The business sessions will be streamlined, limited to three instead of four, but they will be crammed with facts and figures that will mean profits to the ice men who attend them. The first session will open at 9:30 a. m. Monday, October 13, and the final session will close at Noon, Tuesday, October 14.

The annual dinner dance with a floor show will be held Monday night October 13 in the beautiful Crystal Ball Night Club at Tampa Bay. It is promised that the food will be out of this world, the entertainment exciting, the music and lights soft and low.

Georgia Ice Manufacturers Association

RICHARD W. FLORRID, *Secretary*

THE 64th annual convention of the Southern Ice Exchange and the 35th annual convention of the Georgia Ice Manufacturers Association will be held Tuesday and Wednesday, February 24 and 25, 1953 at the Ansley Hotel, Atlanta, Ga.

The usual interesting business and entertainment programs are being prepared.

Ice men in Georgia are so busy selling ice that they have little time for anything else. We are certainly having iceman's weather.

Canadian Association of Ice Industries

MILDRED E. CROFT, Secretary

THERE is no more beautiful spot in Canada in the fall than the Laurentian Mountains, Ste. Adele, Quebec, and this is where the annual convention of the Canadian Association of Ice Industries will be held at "The Chantecler" Hotel on October 21 and 22, 1952.

The "Chantecler" nestles in the midst of the Laurentian Mountains overlooking a mountain lake. In the background is the picturesque village of Ste-Adle-en-haut. Here the visitor can spend an enjoyable hour visiting habitat hand weavers, wood carvers, etc. Not only will it be a wonderful place for the convention this year but the perfect place for icemen to bring their wives for a short holiday.

Small Companies Exempt From Wage-Salary Controls

EFFECTIVE July 30 all companies with certain few exceptions employing eight or less employees are exempt from all wage and salary controls. This exemption is a part of the Defense Production Act as amended by the last Congress. All companies employing eight or less people are included in the exemption.

In determining whether a company has eight or less employees, affiliates must be counted, and proprietors, partners and officers must be listed as employees. If the number in the labor force varies during the year, it is governed by the number employed as of July 29, 1952. If the company employed eight or less people on this date it is exempt and will remain exempt until more than 15 people are employed.

It should be noted that this does not include an exemption from price controls. Rates are still controlled by CPR-34. All companies employing more than eight persons are still subject to all wage and salary controls.

Purdue Magazine Plugs Vegetable Icing

PURDUE University's Retailer Magazine, which offers food merchandising tips to retailers, emphasizes the necessity of cold temperatures and high moisture in protecting freshness of vegetables. It advocates garnishing with plenty of ice.

Brochure Tells the "Why" Of National Ice Association

A BROCHURE has been issued by the National Association of Ice Industries to dramatize the service available to members and to the ice industry generally. "For 35 years," it says, "the National Association of Ice Industries has been the backbone of the ice industry, about 50 per cent of the current members having participated in NAII for over 30 years. There must be a reason.

"Your signature on an application card will set you on the road to the right answer. Do it today. Its the one way of widening your sources of business assistance. The positive action that immediately associates you with folks who talk your language."

Proof of direct benefits is provided by brief quotes from letters received from ice men in all sections of the country telling of the help they have obtained from their membership.

New Wage Board Takes Over With Curtailed Powers

ON July 30 the old WSB headed by Chairman Feinsinger went out of existence. A new tri-partite Board will take over with greatly limited powers. The new Board will have no authority to settle labor disputes and even its wage adjusting and interpreting powers are curtailed by the language of the new Defense Production Act which defines stabilization as "prescribing maximum limits." This is expected to result in rulings and interpretations which are within the regulations. The old WSB operated under a system of flexible rules which frequently resulted in wage increases greater than those permitted under the regulations and which earned it the title "Wage Stimulation Board."

Chicago Ice Producers Pays Record Dividend

DIVIDENDS of 85 percent were paid last year by the Chicago Ice Producers Mutual Liability Company, according to Herbert J. Choice, secretary. Mr. Choice said this was a record high for the company which has paid a total of $1,025,437 in dividends since 1924. Although only a one-man operation, assets of the company as of May 31 were over $597,000 and yearly premium income is more than $220,000.

Division of American Warehousemen's Association

Executive Offices
TOWER BUILDING, WASHINGTON 5, D.C.

Executive Vice-president
WM. DALTON, WASHINGTON, D.C.

Secretary
JOS. H. COLQUITT, WASHINGTON, D.C.

Director of Information
RICHARD F. CURRY, WASHINGTON, D.C.

President
A. B. EFROYMSON, CLEVELAND, OHIO

Vice-president
R. M. CONNOR, CHICAGO, ILL.

Treasurer
CHAS. B. HART, TACOMA, WASH.

THIS MONTH IN BRIEF

A look at what's ahead for the refrigerated warehousing industry by a Canadian warehouseman includes pick-up and delivery by helicopters, and other modern ideas.

A new cold storage plant, 1600 feet long and 200 feet wide has been constructed at Alameda, California to house the United States Army Quartermaster plant. It is accessible to both water and rail transportation.

A third research project on refrigerated storage of candy is being planned under the auspicies of the Refrigeration Research Foundation, the Georgia Experiment Station, and the National Confectioners' Association.

A high accident record and mounting costs of insurance caused a refrigerated warehouse company to institute a safety training program. Result was a reduction from 645 to 4 percent within three years.

A Look at What's Ahead For Refrigerated Warehousing

W. DENNIS DAY
Terminal Warehouses, Ltd.
Toronto, Ontario, Canada

In this article, Mr. Day suggests that cold storage deliveries by helicopter are among some of the possible future developments. He said that the large refrigerated warehouse of the future should have a very strong, flat, unobstructed roof for the landing of helicopters to deliver goods to and from the nearest airport. Other less distant developments foreseen by Mr. Day include lower temperatures, increased mechanical handling, completely automatic refrigerating and defrosting, greatly increased efficiency of pipe coils, increasing importance of humidity, more efficient plant design, more delicious and nutritious cold storage products through improved storing and handling techniques.

I HAVE no intention of holding myself up as a prophet or of pretending that I have the gift of second sight. I do believe, however that we can all benefit from a review of what has happened in the cold storage industry in the past and from this, predict what is going to happen in the future.

We must keep in mind one thing —the great changes within the industry during the last twenty years. Cold storages, as we know them, are rapidly approaching their first one hundred years. The first commercial cold storage plant on this continent was opened in New York in 1865, and the first railroad-refrigerated car was in operation in 1868. These adventures in industry, both in storage and transportation, were correctly hailed as great advances in the preservation of food. The pioneers had great courage and devotion. They used natural ice as a refrigerant, and added salt if a temperature below 45°F. was required. Storage was limited to butter, cheese, eggs, fish, fruit and nuts, and the length of the storage period was usually quite short.

Mechanical Refrigeration

I will skip over the troubles and tribulations of the pioneers and jump to the next great advance—that of mechanical refrigeration about 1890. Again, the pioneers cannot be blamed for considering that Utopia had been reached. No more messy ice or salt—instead, machinery to provide temperature as low as 15° above zero. Feeling that no further radical changes would be possible, they settled down to a steady, satisfactory business. Warehouses were built to last one hundred years, and compressors to last fifty, and many of them have done so.

Most of you know of the changes that have crept in during the last twenty years. Temperatures have gone lower and lower, necessitating added insulation and high speed compressors; the big change-over from cooler to freezer space; the addition, year by year, of new items requiring refrigeration. Let us enumerate a few which were not dreamed of years ago—blood plasma, drugs, by-products of meat, not worth considering a few years ago but now invaluable for medical reasons, tobacco and candy. We have also developed into the age of packaging—for example, poultry put up in attractive containers and hams wrapped for appeal. Humidity has become extremely important.

Presented at the Annual Meeting of the Canadian Warehousemen's Association at Vancouver, B.C., June 24, 1952.

For the best guide to the future is an analysis of the immediate past and the present. In talking about these improvements, I do not wish to indicate that we will leave the old-time plant on a Saturday evening and start off with a new, modern, up-to-date plant on Monday morning. Changes are going to be gradual in most respects, but we must observe the trend in the industry when we plan additions, modernizations, etc. I think we can roughly divide the reasons for the changes into two categories. In the first place, we have the demands of our customers for the storage of new products, and also in this category we have, of course, the lower temperatures, fast freezing, proper humidities and so on. In the second category, the changes have been forced upon us for economic reasons. In company with the entire industrial world, we have had to face higher wage costs; therefore, we have had to increase the productivity of labor.

That is, invest more capital per employee, and have machines do more of the work. The trend to one story warehouses is a natural condition caused by this problem. It eliminates elevator operators and the man handling of merchandise. Machines pile it to heights undreamed of a few years ago. Higher speed compressors are another example and the trend to automatic machines does away with considerable operating labor. We have pipes of which two feet will give the same refrigerating value as twelve feet of the old style pipe. We have automatic defrosting units. We have conveyors of all types.

The Future

We now come to the meat of the subject. What lies ahead for the cold storage industry? A real pessimist could say that it will either pass out of existence or be radically reduced to the storing of very cheap items. His theory would be based on the preserving of goods by new methods. Most of us know that machines have been developed to preserve food by means of rays. Far be it from me to say that this new venture will never be successful. We do know that to date, the bugs in it have been tremendous. Some appetizing foods become actually obnoxious while others, like caster oil, become quite palatable. It will take a long while for such a development, and the goods will still have to be stored.

We in the industry may have to scrap our compressors and buy some of these machines. However, I think we are safe in stating that the industry will go on in a bigger and better way for a long time to come. I am not going to venture to what extent the temperatures will be lowered. Fifty years ago, a cold storage man would have laughed at a fast freezing temperature of 30 F below zero, or a holding temperature of 10F below, but I would advise people who are enlarging, building or modernizing, to have plenty of refrigeration, plenty of pipe work, or make provisions for adding it at a later date. At a Canadian Warehousemen's Association convention in 1975, someone will say: "Do you remember when they considered 10F below a good holding room temperature?"

Automatic Operation

Any operator enlarging his plant should give serious consideration to automatic operation, even where the law, or good common sense indicates that an operator is necessary. Equip the plant with all the safeguards you can line up. Do not be satisfied with alarms to indicate to the operator that something is wrong. In the electronic field today, you can purchase quite reasonably gadgets that will shut your plant down before any damage is done. New types of pipe that are ten times as efficient as the old and that are easy to defrost, are a "must" in future developments. The public, and the industry itself, will expect better housekeeping in the future—rooms that are more easily cleaned, and do not make it easy for mold or bacteria action. Humidities are going to be more and more important. The public are not going to be satisfied in March with an apple that has a cold storage look. They are going to demand that it be as close to the same state as when it was gathered in October as it is humanly possible to have it. In other words, it is not just food preservation—the public today are taste and quality conscious. We have made tremendous progress in this connection. We can all remember when the public turned up their noses at frozen meats and poultry, but now frozen goods usually command premium prices. However, we cannot take the attitude that we have reached perfection. There must be a continual striving for better and better results.

Now in the second category, it is perfectly obvious that it is not economically sound to tear down an eight story warehouse and replace it with a single-story building. We must, however, develop and plan every type of labor-saving device known, and in future planning, give serious consideration to labor-saving machinery and fast handling methods. Plant design will be extremely important with the lower temperatures; provision must be made to freeze goods in special rooms before placing them in the holding rooms.

Last, but not least, we have our shipping and receiving facilities. The average warehouse building, erected only twenty years ago, has one serious failing today—too much railroad track and not enough motor truck shipping space. Some plants cannot handle the modern, fifty-foot railroad car. Some trucks bays are too small for the modern tractor-trailer unit. In planning for the future, this problem must be taken into consideration and future changes allowed for.

Delivery by Helicopter

The next statement may seem, at first hand, to be rather far-fetched but, on second thought, is it? The statement is—"The large cold storage plant of the future should have a strong, flat roof, unobstructed by elevator penthouses, etc., for the landing of helicopters to deliver goods from the nearest air port, or, of course, to pick them up for shipment by air."

In conclusion, we must never consider the cold storage industry is doing a good and satisfactory job. To do so would be to go backwards. You must always say—"What will the industry and its customers demand in the future? How can we keep up with modern conditions?"

H. A. Gross Retires

H. A. Gross, vice-president of Booth Fisheries Corp., Chicago, and vice-president and general manager of Booth Cold Storage Co. has retired after 30 years service, R. P. Fletcher, Jr., president of Booth announced. Mr. Gross started with Booth as warehouse superintendent in 1920 and was named vice-president in 1946.

W. L. Davis, manager of the company's Minneapolis warehouse, will succeed Mr. Gross as general manager of Booth Cold Storage Companies. Carl E. Swanson, superintendent of the Minneapolis warehouse will succeed Mr. Davis as manager of the company's Minneapolis warehouse and Clarence E. Anderson will succeed Mr. Swanson as superintendent of that warehouse.

ARMY OCCUPIES HUGE WAREHOUSE

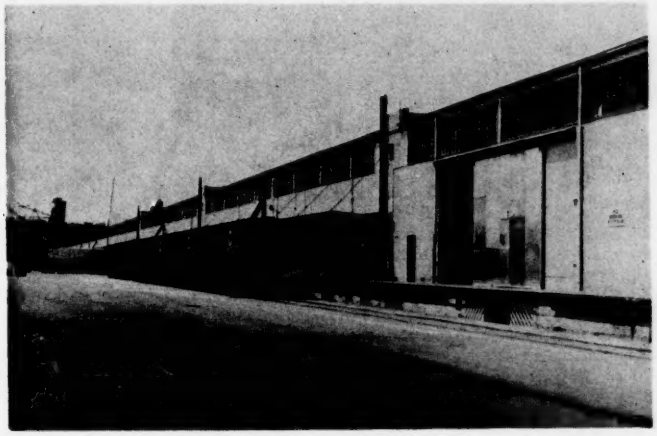
New Single Story Cold Storage Plant at Alameda, California Built for United States Army One of Largest Under One Roof. Many Innovations in Modern Construction Methods

WALTER L. JONES
Owens-Corning Fibreglass Corp.
San Francisco, California

R. R. RIDELL
American Bitumuls Asphalt Co.
Oakland, California

A ONE-STORY warehouse of heavy frame construction, 1600 feet long and 200 feet wide, houses the United States Army Quartermaster cold storage plant in Alameda, Calif. It constitutes one of the largest cold storage plants under one roof in the world. It operates under the official name of The Alameda Cold Storage Terminal, U. S. Army Quartermaster Market Center System. The facility is now located on government-owned property while the former Mission Bay plant was on leased property in San Francisco.

Formerly a naval supply warehouse, the building was taken over by the San Francisco Quartermaster Market Center, U. S. Army, in 1950, when, because of expansion plans, it became necessary for them to vacate their Mission Bay cold storage plant in San Francisco.



Eastern side of Alameda cold storage plant, with railroad siding and space for trucks.

Rail and Motor Transport

The present warehouse, situated on the Oakland Estuary, is accessible to both rail and water transportation. The eastern side of the building is reserved for the loading and unloading of refrigerated trucks and railroad cars. Seagoing vessels may load and unload on the opposite side. Operation of the plant is completely palletized. Each room has vestibule type doors opening on the loading ramps. Warehousing and terminal operations are conducted under the command of the officer in charge, San Francisco Quartermaster Market Center. Mechanical operation and maintenance of the facility are functions of the U. S. Army engineers.

Two important factors that influenced the over-all design of the plant were that material costs were increasing and materials were becoming progressively scarcer while the designing was still in progress. The job was built on a set appropriation from Congress which allowed no extras. And, too, the moving had to be done without interrupting the flow of food to military installations here and overseas. This was accomplished by moving one-half of the San Francisco plant, leaving the remaining facilities in operation.

The warehouse is divided into nine bays, five of which are insulated as cold storage rooms. The rooms are all equal in size—175x180 ft. Temperatures in the cold storage areas range from 30 to 0 F. Of the remaining rooms, three are utilized as dry storage areas and one as a machine room and offices. An average of 60-car or truck lots are handled inbound daily with peak days of up to 200 inbound lots.

In the five cold storage rooms, 1,200,000 board feet of 3 inch asphalt enclosed fiberglas board (24x48 inches) were installed in a matter of forty-four days. However, before actual construction was begun, considerable thought was given to the design of the insulation. A disastrous fire during construction of the Mission Bay Plant, while using hot asphalt as an insulation adhesive, led to a consideration of cold applied materials for the new plant at Alameda. Laykold Insulation Adhesive and Laykold Cement were approved by the Government for use in this project.

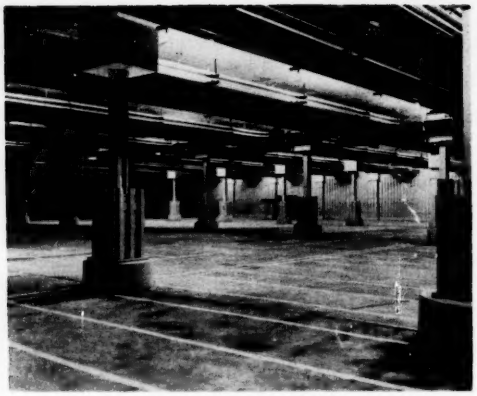
Floors

The floors of the plant consist of a 30 lb. dry asphalt felt slip sheet over a concrete slab. This sheet was sprayed with Laykold Adhesive; the first layer of 3 inch cork board was pressed into the adhesive membrane; Laykold Insulation Adhesive was then sprayed on the first layer, after which the second layer of 3-in. cork board was pressed into the first layer. The second layer was then sprayed with Laykold Adhesive to seal the cork against moisture encroachment from the concrete slab. It was then covered with a light building paper to permit walking on the sprayed insulation while the 4-in. concrete slab was poured for the final wearing surface. Nine hundred thousand board feet of cork board were installed underneath the 4-in. slab.

Special Wood Ceilings

Wood ceilings supported by steel columns eighteen feet high were installed and the cross beams covered with a tongue and groove sheathing. An asphalt felt vapor barrier was placed on the top side of the false ceiling. One-half inch galvanized iron mesh rat proofing and two layers of 3-in. A. E. Fiberglas board were then added to the underside of the ceilings.

The vapor barrier is made up of two layers of 15 lb. asphalt felt. The first layer was nailed to the wood sheathing, given a spray of Laykold Insulation Adhesive, after which the second layer of felt was rolled in with all joints, lapped and sealed.



One of the five cold storage rooms. Note wood bumper guards protecting insulation.

Another cold storage room showing overhead blower cooling system.

Once the rat proofing had been nailed in place, the ceilings were sprayed with Laykold Adhesive. Next, the first layer of Fiberglass A. E. board was sprayed and nailed in place with 20-penny, 9-gauge galvanized nails with a 1½-in. washer nailed in place with 20-penny, 9-gauge galvanized nails with a 1½-in. washer cap. Two or more nails were used per square foot of board. The second layer of 3-in. board, having been sprayed with the adhesive, was pressed into place by special jacks and secured with 7-in. wood skewers inserted diagonally at the rate of at least three per square foot of board.

The ceiling height will allow the stacking of pallets three-high in the cold storage rooms.

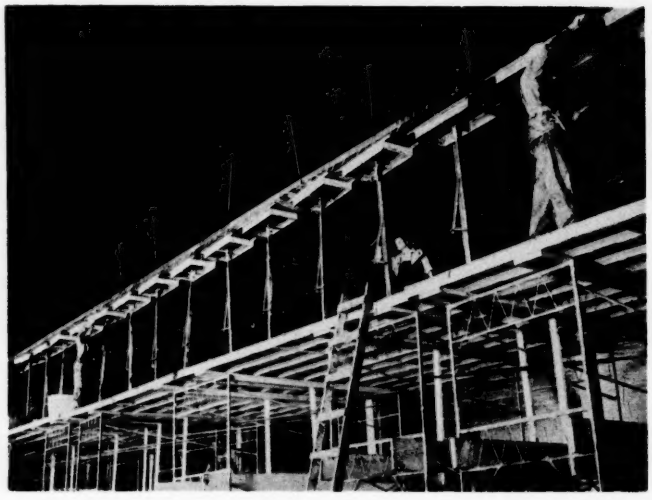
Wood Walls and Concrete Fire Walls

A layer of 30-lb. felt was nailed to the wood walls and ½-in. mesh rat proofing was then nailed over the felt and given a spray coating of Laykold Insulation Adhesive. Following this operation, two layers of 3-in. Fiberglas board were installed in the same manner as on the ceilings.

Since it was not practical to nail a vapor barrier or first course of insulation to the concrete, Laykold Cement was screeded onto the Fiberglas boards which were placed directly to the bare concrete. Here, the Laykold Cement serves both as a partial vapor barrier and adhesive. The second layer of 3-in. Fiberglas board was held in place with Laykold Adhesive and wood skewers in the same manner as on the second layers of the wood walls.

Spraying Done "After Hours"

A total of almost 50,000 gallons of Laykold Insulation Adhesive was sprayed by a two-man crew with a mobile spray rig operating at night while the insulating crews were absent. Each night sufficient boards



A detail of insulation installation showing a battery of jacks holding the Fiberglas A. E. board second layer to the first layer while skewers are being inserted.

Fiberglas boards, coated with Laykold Cement being placed directly on the bare concrete fire walls.

were laid out and spray coated in a prepared area of sand and gravel. Also the selected area to be insulated such as a wall or ceiling was spray-coated for use the following day.

Refrigeration Facilities

Three of the freezer rooms are held at 0 F. by brine coil refrigeration; one cooler room is held at 30 F. by air ducts and unit refrigeration; another room is used as a combination freezer and cooler, with air duct and unit refrigeration. These rooms are equipped with 27 York floor mounted air conditioning-type units. Nine are direct expansion ammonia units and 18 are brine shell and tube type.

The machine room consists of one 13x9 compressor, two 9x9 compressors and four 10x10 compressors, with synchronous motor drives.

Four evaporator condensers are used in the system; 10,000 pounds of ammonia and 50,000 gallons of calcium chloride solution circulate through more than 35 miles of brine lines to produce a 260 ton per day refrigerating capacity.

Special Equipment Required for Construction

Wood bumper guards of Douglas fir were placed around all the walls and columns of the cold storage rooms to protect the insulation. The guards were designed in sections so that they could be put up with a minimum amount of time and effort.

In addition to the special jacks used to insure adequate adhesion of the first and second layers of insulation, racks for handling the A. E. boards after they had been sprayed were designed and built. Forty-four hundred square feet of roll-away staging were designed for use in the construction of the plant. Also, a curved nail was used which penetrated both layers of insulation so that there would be no separation. The contractors went as far as to pioneer the use of mechanical equipment (fork lifts) in the handling of all insulation materials from freight cars to the spraying room and on to the staging preparatory to the installation. Power saws were used to pre-cut as much material as possible.

Trewhitt-Shields and Fisher of Fresno, Calif., were the general contractors to the Army Engineers, the contract being let on competitive bidding. The Fiberglas Engineering and Supply Company, sub-contractors to the Fresno firm, installed all Fiberglas board in the plant. In cooperation with the Owens-Corning Fiberglas Corporation, they also designed much of the special equipment used. The American Bitumulus & Asphalt Company supplied the Laykold Insulation Adhesive and Laykold Cement used throughout the building. James M. Smith of San Francisco was the architect. The plant was designed and built under the supervision of the San Francisco District, U. S. Army Corps of Engineers for the U. S. Army Quartermaster Market Center of San Francisco.

Refrigerated Warehouse Space Increases

REFRIGERATED cold storage warehouses in the United States had a gross capacity of 711 million cubic feet in October, 1951, an increase of approximately 10 million cubic feet over the capacity in October, 1949, according to a biennial report issued by the United States Department of Agriculture. Most of the increase was reported by storage on the West coast and in the South Atlantic States.

Sharp Freezer Storage Space Shows Increase

As of October 1, 1951, the capacity of sharp freezer storage warehouses capable of maintaining a temperature 0 F. or below totaled 212 million cubic feet compared with 168 million in 1949. Capacities in freezer space (0 to 29 F.) and cooler capacity (above 29 F.) each showed declines during the 2-year period. The capacity of freezer space totaled 92 million cubic feet. Cooler capacity was 407 million cubic feet.

A refrigerated warehouse is defined as one artificially cooled to 50 F. or lower and in which foods are generally stored for 30 days or more.

The final report giving warehouse capacity by regions, states, and cities will be issued in September and will be available upon request from the Office of Information Services, Production and Marketing Administration, U. S. Department of Agriculture, Washington, 25, D. C.

A preliminary summary of this, the 16th biennial survey of the capacity of refrigerated storage warehouses, is shown in the following table:

GROSS REFRIGERATED WAREHOUSE CAPACITY, OCTOBER 1, 1949 AND 1951

Type of refrigerated storage	Sharp Freezer		Freezer		Cooler		Total	
	1951 Million cu. ft.	1949 Million cu. ft.	1951 Million cu. ft.	1949 Million cu. ft.	1951 Million cu. ft.	1949 Million cu. ft.	1951 Million cu. ft.	1949 Million cu. ft.
Public	169	135	51	57	205	222	425	414
Private and semi-private	29	21	23	21	136	129	188	171
Meat-packing plants	14	12	18	19	66	85	98	116
Total	212	168	92	97	407	436	711	701

Refrigerated Warehousing

TRRF Enlarges Short Term Studies

THE executive committee of The Refrigeration Research Foundation has approved the establishment of a provision for short term investigations, to be administered from the Office of the Director of the Foundation. In this case, instead of the administration of short-term studies by a scientist in a research institution or agency, it is stated that the director will carry on that function personally. This new provision will enable him to make use of technical services of scientists and engineers who are not directly connected with research organizations. The purpose is to enlarge the scope of the Foundation's activities and facilitate the solution of certain problems.

Tax Amortization

CERTIFICATES of necessity for tax amortization of new or expanded facilities have been approved by the Defense Production Administration as follows: Best Ice & Locker Co., Gainsville, Ga., public storage warehouse facilities. Amount certified $44,088 of which 55 percent was allowed; U. S. Growers & Shippers Service Inc., Los Angeles, Calif., Amount certified $430,500 of which 55 percent was allowed.

Booth Fisheries Employees Retire

RETIREMENT of two veteran employees of the Booth Fisheries Corp. has been announced by R. P. Fletcher, Jr., president. H. G. Martin, general cashier of the company, retired May 16 after forty years of service. He started with Booth in its main office in 1912. W. J. Brink retired May 24, after forty-seven years of service. Mr. Brink joined Booth Fisheries in its Cincinnati branch in 1905. At his retirement, he was manager of the company's Indianapolis branch.

Conference Plans Research Project on How Refrigeration Affects Candy

PREVENTION of sugar blooming of refrigerated candies' was the' theme of a conference held August 4 at Chicago, headquarters of the National Confectioners Association for the purpose of planning a third research project under the tri-sponsorship of the Refrigeration Research Foundation the Georgia Experiment Station and the National Confectioners' Association.

Objectives of this work will be to determine the influences of several types of packaging materials when used on a variety of candies under varying storage conditions. Among the types of candies to receive consideration are chocolate coated vanilla creams, chocolate coated marshmallows, chocolate coated cherries, chocolate coated caramels, chocolate coated nougats and assorted candies.

Storage Conditions Varied

Candies are to be stored in rooms of three temperatures, namely, 60F., 32F., and —5F. with variation not to exceed one degree, plus or minus. The relative humidity of the packaging and conditioning rooms will be predetermined. At the present time it is expected that the various samples will be packaged in a room 40 to 45 percent relative humidity and the conditioning room will be kept at 40 to 45 percent relative humidity.

In a few of the samples it is expected that a desiccant will be included in the candy package or box.

Various Wraps Used

The candies will be wrapped in different types of packaging material, such as cellophane, glassine and waxed papers and aluminum foil. Advice of suppliers of these types of materials is being secured in order that specific characteristics of the materials, such as grade, will be definitely known, as well as commercial practices prevailing.

The amount of sugar bloom or dulling of the surface will be studied by observation, with the microscope, measured with an electric photometer and photographed.

It is expected that the project will start this fall. The other two projects sponsored by the three organizations related to storage of peanuts and nuts used in candies and to shelf life of candy.

This group of scientists and confectioners meet to make plans for research project on candy. Seated: John O'Rourke, Mars Inc.; C. O. Dicken, E. J. Brach & Sons; Norman Eppel, QM Food and Container Institute; Dr. J. G. Woodroof, Georgia Experiment Station; NCA President Philip P. Gott; H. C. Diehl, Managing Director, Refrigeration Research Foundation; Robert Couch, General Foods Corp., Packaging Institute; Dr. Carl Kayan, Columbia University; and J. J. Alikonis, Paul F. Beich Co. Standing: G. Lloyd Latten, Schutter Candy Co.; G. S. Doolin, NCA Staff; H. B. Cosler, QM Food and Container Institute; Milo Schroeder, Williamson Candy Co.; Wm. Beuman, Williamson Candy Co.; and Otto Windt, E. J. Brach & Sons.

Atmosphere Purification Studies Commended

THE current "Information Bulletin" issued by the Refrigeration Research Foundation points with much interest toward the recent studies of atmosphere purification. It says that "As every TRRF member well knows, the subject of air purification in apple and pear storages is controversial. The studies aided by the Foundation in several institutions and those conducted without TRRF aid during the past eight or nine years, have brought a large amount of data and carefully recorded study into the arena of discussion.

For that reason, we can heartily wish that every member will have an opportunity to read carefully the article by Prof. R. M. Smock of Cornell University, Ithaca, N. Y., in the July number of ICE AND REFRIGERATION. It sums up the controversy, discusses the various studies that have been conducted, and reveals the status of the subject as it stands at present in a very fair manner.

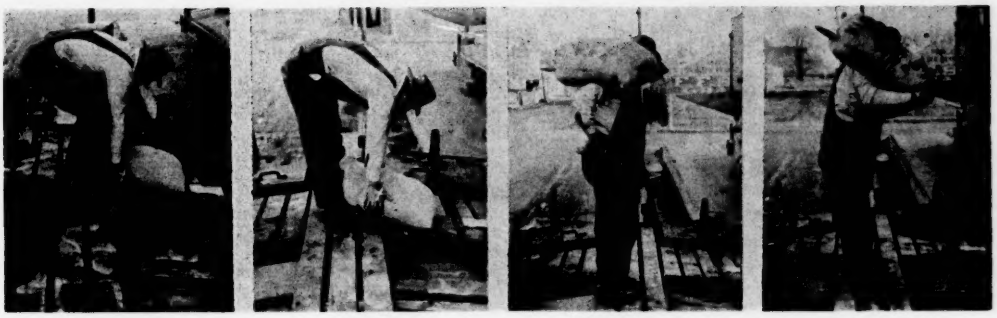
"Out of this discussion and out of continuing studies, such as those now aided by the Foundation at Purdue University, are coming definitely valuable facts—such as the fact that ethylene is not the only volatile involved, the fact that preclimacteric and not older apples will respond to the treatment, and the indications that faultry air distribution, faulty operation and possibly type of refrigeration have had much to do with the various successes and failures. The overall encouraging fact is the basic truth that we are learning more and more about the components of storage atmospheres and means for their control."

Training Conferences

TRAINING conferences for refrigerated warehouse employees will be resumed, jointly sponsored by the Refrigeration Research Foundation and the National Association of Refrigerated Warehouses. The first will be held February 2-5, 1953 in St. Louis, and another March 2-5, at San Jose, Calif. This will mark renewal of the technical conference program that TRRF conducted in nearly all parts of the country a few years ago. The new programs will emphasize training, new facts and new developments, directed toward operating personnel.

Shoemaker Honored

PERRY M. SHOEMAKER on August 1 becomes president of the D L & W Railway. Only 46, Mr. Shoemaker is the son of J. R. Shoemaker of Elmira, N. Y., well known president of the Hyziea Refrigerating Co. of that city.



RIGHT *WRONG* *RIGHT* *WRONG*

Showing right and wrong ways of lifting and carrying a heavy bag. From illustrations used by Crystal Ice & Cold Storage Company.

SAFETY PROGRAM CUTS LOSSES

High accident record and fantastically high insurance costs leads to formulation of safety program, under which, within three years, loss ratio was reduced from 645 to 4 percent

At the annual convention of the National Association of Refrigerated Warehouses at New Orleans, A. R. Carstensen, President of the Crystal Ice & Cold Storage Company, Sacramento, Calif., outlined the company's safety program which resulted in reducing the loss ratio from 645 to 4 percent in three years. This is such an outstanding demonstration of the value of safety training that we are glad of this opportunity of passing his talk along for the benefit of readers who may wish to use this experience as an aid in their own safety program.

THE Crystal Ice & Cold Storage Company, of Sacramento, Calif., submits the figures in the following table as evidence of the results that may be expected by any ice and cold storage company, when a constructive safety program is carried on over a period of several years.

THE CRYSTAL'S SAFETY RECORD FOR THE PAST FOUR YEARS

Year	Total Injuries	Time Lost days	Frequency Rate	Severity Rate	Loss Ratio
1948	No Safety Program				645%
1949	8	146	110	2.01	29%
1950	3	34	41	.46	8%
1951	1	6	16	.10	4%

The concerted safety program was started in 1949, after the disastrous experience of 1948. Complete records were not kept previous to 1949, however the loss ratio of 1948 reveals the sad state of affairs. The loss ratio is the percent of the company's premiums which is paid out in claims by the insurance carrier.

The Crystal Ice & Cold Storage Company operates a 60-ton ice tank, a field car icing and pre-cooling department, and about ¾'s of a million cubic feet of cold storage space. They have only 26 steady employees, with an additional 25 to 30 casuals during the summer. The situation is complicated by the fact that the 25 to 30 summer employees are, for the most part, different individuals each year. They are working in the field away from the plant operation so that proper supervision and training is a big problem.

Four years ago, we found ourselves with a war weary organization made up of poorly trained employees who in many instances frankly, didn't give a damn. Our accident record and resulting costs truly reflected the situation. One year, our insurance carrier paid in claims six times as much as we paid them in premiums. When we added our hidden costs to our premium the figure was large enough to shake management out of its lethargy.

Employee Relations Weak

An analysis of the poor safety record revealed definite weaknesses in employee relations. All employees were interviewed individually, and finally a general meeting was called. When the problem was submitted, it was found that the employees were willing to cooperate in the promotion of any reasonable program in which management would take the lead and lend its full support. The information gained, and the goodwill created, by the individual interviews encouraged the company to institute a program of annual interviews with each employee. These interviews are held on a man to man basis with the employee having an opportunity to make suggestions and criticisms, and to present his individual problems to management.

A social club was organized, with all male employees, including members of management, invited and encouraged to become members. The Club meets one night each month, with the exception of the month of July. Social functions for the entire year are scheduled by the entertainment committee and presented to the Club at the January meeting. The

functions include bowling, bingo, a visit to the hot rod races, a family picnic, a Christmas party and, an annual stag party. The average attendance for each year has been above 85 percent at the regular monthly meetings.

Safety Committee

A general safety committee was appointed to function under the auspices of the Club, with a membership composed of one supervisor from each of the three departments, the assistant manager as chairman, and the president of the company representing management. An Investigating Safety Committee was appointed with a membership composed of one man from each of the three departments (not a supervisor), and the assistant manager as chairman. A safety theme is chosen for each month of the year at the beginning of the year. Examples of the type of themes used are: Good Housekeeping Month; Ice Handling Month; Safety With Tools; Safety In the Homes and Off the Job, and Fire Prevention Month. Safety programs appropriate to the theme of the month are presented at the Club meetings by members of the Club, well versed guests, or in the form of a movie.

At first it was decided not to discuss company business, other than safety, at the Club meetings, but as all employees became more interested in the success of the company, the membership voted to have panel discussions on subjects pertaining to the industry in general and the company in particular. The panels may be made up of members or invited guests. The president of the company now makes a short talk at the December meeting, informing the members of the status of the company, the current problems, and the plans for the coming year.

A house organ has been published for the past three years. This mimeographed paper is mailed to the homes of each employee a few days before each monthly Club meeting. It has been found that the wives of the employees are the most ardent readers. The paper includes current news of the industry, personal notes, safety news, club news and an editorial.

There is a tendency in safety work to take a negative approach, since the objective is to prevent rather than create. A successful accident prevention program must be posiitve. Training in proper procedures and fire drills are positive. Periodical inspection of the plant for possible hazards must be made, and when these hazards are found, action must be taken immediately to make physical changes, if necessary at the expense of overtime. Just telling people to work safely is not enough.

An average of thirty eight major physical changes have been made to the plant and equipment in the interest of safety during each of the past four years. These changes not only prevent accidents by eliminating hazards, but they create a positive approach and keep all employees conscious of safety. Proper painting of equipment in accordance with the National Safety Code is an important part of the program.

Safety Contests Between Departments

Each year a safety contest between the three departments is sponsored by the Club. At the beginning of the year the safety committee writes definite rules covering the contest, and after the membership passes on the rules, they are published in the house organ. Each contest is different. The company puts up money in accordance with the rules of the contest, always on the basis of more prize money for a betterment of the previous record. Each employee in the winning department receives a prize of his choice from a list of gifts designed for use in the home. During the past years, the employees of the winning departments have taken home prizes such as a vacuum cleaner, electric broiler, radio, or the equivalent in two or three less expensive articles. The prizes help to bring the safety program to the attention of the wives and the entire family.

Different props have been used to keep interest in the contests. One year the "White Elephant" was used in the manner outlined by The National Safety Council. During the past two years the "Eight Ball" has been used. At the beginning of the first year a cigarette lighter in the form of a ball with a green safety cross painted on the top was presented to each department head to keep on his desk. The first lost time accident occurred in the production department, and at that time the green cross ball was taken away from the desk of the chief engineer and the "Eight Ball" was put in its place. There it will remain until there is a lost time accident in another department. The person experiencing the 1st time accident sits on a special high stool behind a high "Eight Ball" at all Club meetings. This will be his position until the next lost time accident.

Safety "Props"

The props are depicted in the house organ, and the progress of the contest is depicted by a horse race with one horse representing each department and with the department head serving as the jockey.

When the program was first started there were sufficient accidents for investigation to keep publicity going and interest aroused. Now that the accidents have become very infrequent, the safety committee has designed a new form titled, "Accident Prevention Form". When a new accident takes place where a man might have been injured, but where no injury occurs, this form is filled out by the supervisor and an investigation ensues. It was found that this form of reporting helps to bring to light wrong procedures which can be corrected before an injury occurs.

Safety posters in keeping with the theme of the month are displayed about the plant and at the field jobs. When an accident occurs, appropriate posters are posted immediately. Cards show the number of days worked since the last lost time accident, the number of days changed each morning.

Individual safety award pins available through the National Safety Council are presented to the employee at the meeting, next after the anniversary of his employment or the anniversary of his last lost time accident. These pins are of different colors and show the number of years that the man has worked since his last lost time accident. These pins become proud possessions as the years pass without an accident.

Training Course

At the beginning of the car icing and pre-cooling season, the men who are to become supervisors (for the most part college students) are given a one day training course which stresses safety. A manual has been prepared for their guidance on the job. This manual has a section on safety and one on first aid. During the training program slides showing right and wrong methods of performing the various jobs involved in the operations are used effectively.

What started out as a safety program, has developed into something with a much broader scope. As safety is discussed in the meetings and within the departments, suggestions for better and more efficient procedures come forth. With safety as a common meeting ground, better relations are developed and the entire group is welded into one with common interests, the betterment of the company for the benefit of individuals.

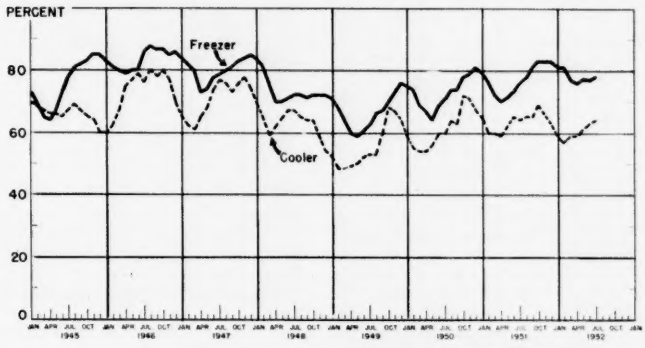
July 31 Cold Storage Holdings

END OF July occupancy in public cooler and freeger space was 64 and 78 percent respectively according to warehouse reports received by the Department of Agriculture. During the month, occupancy of cooler space increased two percentage points which is in contrast to a point decline last year and no change in occupancy from the end of June to end of July during the 5-year period ended 1951. Despite the increase, however, current cooler occupancy was only equal to the occupancy reported last year and the July 31 average. Yet, cooler occupancy was above average for this time of year in the Middle Atlantic, East South Central, and Mountain region, whereas, in the other areas, below average occupancy prevailed.

Utilization of freezer space, likewise, did not follow the historical pattern during July as occupancy failed to increase as was expected. Instead of an increase, end-of-July occupancy was only equal to the use reported on June 30. But, compared with previous years, the July occupancy of 78 percent was six points above average and two points greater than last year. Several areas, however, did report greater use of freezer space by the end of July than June 30 and they were as follows: Middle Atlantic; East North Central; and Pacific.

Net accumulations of fresh pears, cheese, selected meat items and miscellaneous cooler products exceeded July net withdrawals of beef, pork, shell and dried eggs, nuts and nutmeats to bring national holdings of cooler stored weights up to 1.3 billion pounds by the end of the month, the same amount as a year ago and compares with 1.4 billion average July 31 stocks. A net disappearance of 53 million pounds during July reduced total weight in freezer storage to 2.3 billion pounds. This decrease is in contrast to an average July gain of 116 million pounds and a net increase of 104 million pounds reported last year. This year's significant reduction in freezer weights during July is a result of greater than average withdrawals of frozen beef, pork, and poultry which colectively moved from storage two and a half times faster than average.

Less than average gains in national holdings of frozen fruits were reported during July and by the end of the month stocks were 304 million pounds. The 58 million pound July increase was 3 million pounds less than average and the seasonal increase last year at which time total stocks were 318 million pounds, while average July 31 holdings were 308 million pounds.



Occupancy of Refrigerated Warehouses 1945-1952

Significant increases were reported in holdings of cherries, respberries, and strawberries. A gain of 33 million pounds in cherry stocks brought holdings to almost 56 million pounds while raspberries increased 17 million to 26 million pounds. Strawberry stocks totaled 137 million pounds

TABLE 1—COLD STORAGE HOLDINGS IN PUBLIC, PRIVATE AND SEMI-PRIVATE WAREHOUSES, APPLE HOUSES AND MEAT PACKING PLANTS (000 LBS.)

	July 31 1952	June 30, 1952	July 31, 1951	Five-year Average
Meat and meat products, lbs.	856,167	1,029,337	700,943	605,155
Lard and rendered pork fat, lbs.	133,359	132,041	46,820	123,546
Frozen poultry, lbs.	156,438	174,040	106,692	109,427
Creamery butter, lbs.	98,580	68,616	104,405	127,529
American cheese, lbs.	210,263	192,920	227,199	193,282
Other cheese, lbs.	21,168	19,655	26,799	24,630
Shell eggs, cases	2,725	3,357	2,270	3,432
Frozen eggs, lbs.	163,833	166,419	190,818	206,582
Apples, bu.	148	282	294	
Frozen fruits, lbs.	304,380	246,185	317,755	308,471
Frozen vegetables, lbs.	385,474	336,911	369,311	280,234
Frozen fish, lbs.	175,693	152,396	146,891	129,900

TABLE 2—PERCENTAGE OF SPACE OCCUPIED BY PUBLIC COLD STORAGE WAREHOUSES (APPLE HOUSES EXCLUDED)

	Net Piling Space (000 cu. ft.)		July 31, 1952 (%)		June 30, 1952 (%)		July 31, 1951 (%)		5-Year Average (%)	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	3,006	6,264	38	72	40	72	41	90	51	72
Middle Atlantic	29,473	32,964	58	80	54	79	57	80	55	73
East North Central	27,806	25,890	74	81	73	80	76	78	75	71
West North Central	8,881	15,907	72	79	73	87	68	80	77	78
South Atlantic	8,116	9,894	67	79	64	83	68	78	69	75
East South Central	2,403	3,403	82	92	86	94	77	87	79	82
West South Central	7,059	4,438	65	63	68	65	67	62	68	63
Mountain	1,457	2,700	67	76	71	77	54	69	64	77
Pacific	13,038	21,509	50	74	48	71	54	70	51	69
United States	101,840	126,019	64	78	62	78	64	76	64	72

TABLE 3—PERCENTAGE OF SPACE OCCUPIED BY PRIVATE AND SEMI-PRIVATE REFRIGERATED WAREHOUSES AND MEAT PACKING PLANTS (APPLE HOUSES EXCLUDED)

	Private and Semi-Private Warehouses						Meat Packing Establishments					
	Net Piling Space (000 Cu. Ft.)		Space Occupied—Per Cent July 31, 1952		June 30, 1952		Net Piling Space (000 Cu. Ft.)		Space Occupied—Per Cent July 31, 1952		June 30, 1952	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	7	6	50	50	50	50	61	.....	66	..	74	..
Middle Atlantic	1,142	1,525	54	55	21	83	970	228	95	87	68	85
East North Central	3,841	5,303	74	52	60	61	4,865	1,029	82	80	91	64
West North Central	482	2,127	74	84	78	78	7,193	5,648	84	95	87	98
South Atlantic	470	2,610	11	53	13	72	478	214	100	100	100	100
East South Atlantic	105	129	..	11	..	75	302	89	88	89	100	100
West South Central	144	4	28	100	58	97	75	126	100	100	100	100
Mountain	108	162	95	100	44	..	167	146	90	100	89	100
Pacific	1,219	1,595	50	64	17	59	1,209	445	73	88	88	96
United States	7,517	13,460	61	59	35	66	15,408	7,926	84	93	87	93

NOTE: Blank spaces indicate that insufficient returns were received.

for a gain of 6 million since June 30. Area-wise, Middle Atlantic storages reported almost 27 million pounds of cherries while East North Central holdings totaled 18 million pounds.

Pacific Coast stocks of frozen raspberries amounted to more than half of the national total with 14 million in store and their holdings of 66 million pounds of strawberries were three times as great as stocks in the East North Central States which held the second greatest volume of strawberries.

Frozen vegetable holdings were 385 million pounds on July 31 as net accumulations totaled 49 million pounds. While this July increase was better than average, it was about 30 million pounds less than the July 1951 net gain. Except for green peas and snap beans all vegetable items were in lesser supply on July 31 than the month previous. Frozen peas on the other hand reflected a July net increase of 71 million pounds to bring national stocks to almost 175 million pounds. These stocks were at a record high for July 31 and in addition were only about 8 million pounds less than the all time record high reported September 30, 1951. West coast stocks of green peas were the largest with almost 68 million pounds, while Middle Atlantic states reported about 44 million pounds.

Stocks of orange, concentrate were reduced during July by about 4 million gallons leaving almost 24 million on hand by the end of the month. More than helf of the national holdings were in South Atlantic storages while not quite a million gallons were reported by West coast warehouses. But, in the Middle Atlantic States, almost 4 million gallons were on hand.

The nation's stores of cream were only slightly less than average for this time of year with 45 million pounds reported on hand July 31. Average holdings were 48 million while last year the stocks were about 50 million pounds.

The net into storage movement of butter during July was not quite up to average. Stocks increased to almost 9 9million pounds for a gain of 30 million pounds as compared with 128 million pound average July 31 stores and average July gains of 34 million pounds. Current holdings were not much greater than the stocks reported on July 31 1946-1948 during which time holdings of butter were at record lows.

American cheese holdings showed some gains during July and totaled 210 million pounds by the end of the month. This compares with 227 million in store last year and average July 31 stores of 193 million pounds.

Shell eggs moved from storage by three times the average rate and were down to 2.7 million cases. Still in storage, however, were approximately 226,000 cases reserved for sale to the Government beginning September 1. Frozen egg holdings fell off 3 million pounds to 164 million which brought national holdings to the lowest July 31 level since 1940.

About three times as much poultry moved from store during July as last year this time. Total holdings were down 18 million pounds as compared with 6 last year and 7 million during July in the 5-year period ended 1951. Yet, stocks of 156 million pounds were about 50 million pounds above 1951 holdings and surpassed average July holdings by 47 million pounds. Reductions in stocks of fryers, turkeys, and fowls more than countered the 4 million pound net increase in holdings of ducks. Fryers fell off 5 million pounds to 13 million; turkeys totaled 46 million pounds or a net disappearance of 10 million pounds during July; while fowls at 42 million pounds were 5 million pounds under the June 30 stocks.

Almost 100 million pounds more meat moved from storage during July than last year and in July during the 5-year period ended 1951. Net withdrawals last month totaled 173 million pounds while average July withdrawals totaled only 75 million pounds and 77 million pounds in 1951. Yet, total meats in storage of 857 million pounds stands as the largest since 1944 for this time of year.

Holdings of pork fell off sharply during July—138 million pounds—and were thus reduced to 547 million pounds. Last year, stocks totaled 496 million pounds while average July 31 stocks were 420 million pounds.

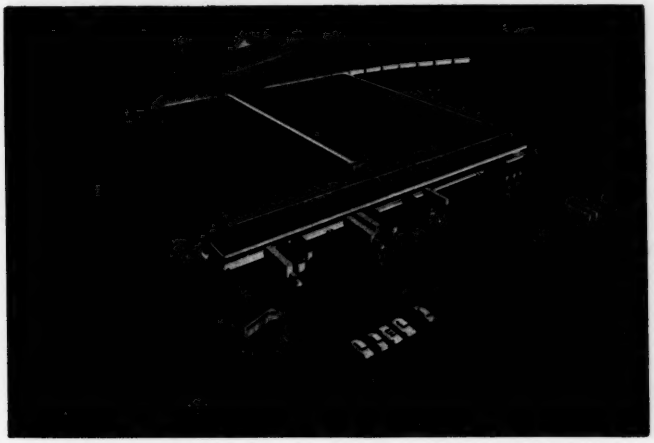
Beef moved from storage by more than four times the average rate of withdrawal and by July 31 stocks were down to 162 million pounds. Except for greater July 31 stocks reported in 1944 and 1945, current holdings were at near record levels for this time of year.

Lard and rendered pork fat holdings moved contra-seasonally and showed a net gain of a million pounds during July. Holdings of 133 million pounds were 10 million pounds greater than average and almost three times as large as lard and rendered pork fat stocks last year.

Storage Outlook

Cooler occupany is expected to rise during August by at least a point. Whether this pattern obtains during the month will depend on the rate of movement of shell eggs from storage which during July moved at a faster rate than indicated by historical performance. Therefore, if this movement continues, cooler occupancy is not likely to increase and may remain at the same level reported July 31. Freezer occupancy did not increase during July as was expected but this can be accounted for by the unusually heavy net withdrawals of meats from storage. However, even if this trend should continue, the expected net accumulations of frozen fruits and vegetables during August should be sufficient to bring freezer occupancy up at least two points.

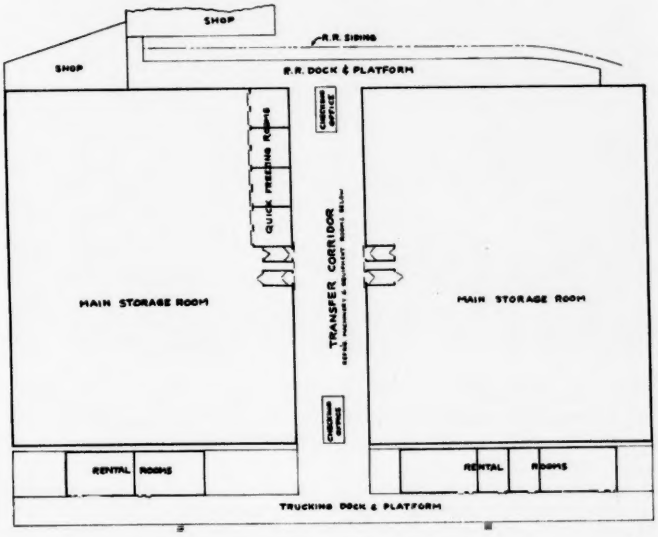
New Refrigerated Warehouse to Supply Sub-Zero Storage



From architect's drawing of new freezer storage to be placed in operation by Merchants Terminal Corporation, Baltimore, Md.

THE Merchants Terminal Corporation of Baltimore, Md., is constructing a new freezer storage which will be placed in operation early this fall. This new refrigerated warehouse in combination with the present plant on Monument street, is to take care of the expanding demand for sub-zero storage and quick-freezing facilities in the Baltimore area.

The new refrigerated warehouse is located on Route 40 at Kresson street in the eastern end of Baltimore. The capacity of the new plant is about 2,000,000 cu. ft. of minus 10 F storage and six break-up rooms totaling about 100,000 cu. ft. to be held at 0 F.



Floor plan of new single-floor plant, showing storage rooms, and other details.

Single floor arrangement an platform level has been followed out with adequate truck and railroad car docking areas. The complete plant is arranged for pallet operation. A large enclosed center corridor connects the platforms and storage entrances so as to provide efficient traffic ways for speedy and safe product handling.

Four (4) quick-freeze chambers are built into one of the low temperature storage rooms which will freeze up to 350,000 lbs. of product daily.

Private air conditioned offices are arranged along the building front and above the small storage rooms which will be made available to users of the storage facilities.

Over-all plant efficiency and safety have been given major consideration in the design. Freon (F-12) was selected as the refrigerant. The plant is thoroughly protected throughout with a sprinkler system for fire protection.

California Refrigerated Warehouses Combined

THE Terminal Refrigerating Co., Los Angeles, Calif., has announced the acquisition of the Burbank Refrigerating Company in Burbank, Calif. The company will continue as a separate corporation, a wholly owned subsidiary of the Terminal Refrigerating Company.

The Burbank plant which was constructed in 1949 was owned and operated by David Rasky. It has about 800,000 cubic ft freezer and cooler space, is of reinforced concrete construction, single story and completely palletized.

Mr. Rasky will continue as president of the company, Harlen J. Niesen will continue as vice president of both companies, Buck Mills will be secretary of both companies and will integrate all production movements. Ray Wyum will become general superintendent of both plants and Robert Cooper will integrate the office procedure, according to an announcement by Mr. Niesen.

Rotary Club To Hear Address on Warehousing

AN ADDRESS on "Warehousing and the part it plays in modern distribution" will be given at the August 14 meeting of the Patterson, N. J. Rotary Club by Frank J. Kerney. The meeting will be held at the Alexander Hamilton Hotel. Mr. Kerney is vice president of the J. Leo Cooke Warehouse Corp., Jersey City, N. J.

Practical Refrigerating Engineer

NATIONAL ASSOCIATION PRACTICAL REFRIGERATING ENGINEERS

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THIS MONTH

Preliminary announcement of 43rd annual convention to be held at Dallas, Texas November 12 to 14, 1952. Educational and entertainment programs will be up to high standard of previous years.

The Question Box has an interesting discussion of contamination of city water by ammonia, also thawing water lines, engine horsepower, and various phases of total heat.

Chapter reports reflect member activities during dull days of summer vacations.

ON TO DALLAS—Setting and Facilities Provide Stage for Big Annual NAPRE Convention November 12-14, 1952

WHAT is there about Dallas that has attracted the 1952 convention of the National Association of Practical Refrigerating Engineers to deep deep in the heart of Texas?

Growth — healthy, diversified growth—is the answer.

Dallas—the Southwest's "Big D"—doesn't expand. It grows by leaps and bounds.

The leaps have soared tall skyscrapers above the flat black lands where John Neely Bryan, Dallas' founder, put up a little one-room log cabin on the banks of the Trinity River slightly over a hundred years ago.

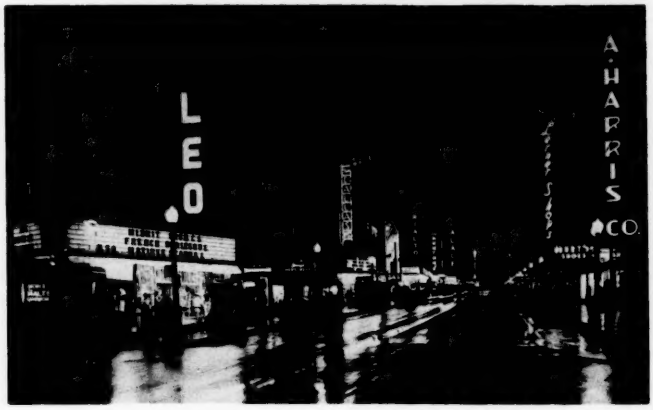
The bounds have spread the city's population of 434,500 over 138 square miles.

And Pioneer Bryan's intentions to start a trading business with the Indians have expanded to a diversified economy of agriculture, fashions, oil, manufacturing, banking and insurance.

As the white men moved in and the Indians moved out, Dallas has become the business and cultural center of the Dallas Southwest, the area comprising Texas, Oklahoma, Louisiana, New Mexico, Arkansas and Mississippi, plus 26 counties of Tennessee.

Pleasures Available

Dallas is a good business town, but it is also a good pleasure town. Visitors can play golf, go fishing or swimming or boating, tramp the midway of the State Fair of Texas, attend a State Fair musical or see Cotton Bowl football, drive in for a barbecue plate under the stars, see a rodeo or join in a square dance—all within the city's limits.



Theater Row in Dallas shows only a part of the city's entertainment facilities, which include 79 motion picture theaters, seven radio stations and two television stations, as well as the nationally famous Theater '52, theater-in-the-round.

Industrial Dallas emphasizes that modern manufacturing and industrial operations can be carried on under the shadows of a convenient downtown district.

Dallas' parks system, with more than 6,000 acres, includes 80 public parks, 11 swimming pools (for adults), 25 lighted softball diamonds, three golf courses and a 60-acre zoo. White Rock Lake, a 1,200-acre body of water, is a 15-minute run by automobile from the downtown area. It offers picnicking, swimming, fishing, water skiing, surf-boarding, sailing and a view of the handsome homes bordering the lake.

Climate makes the big difference to recreation in Dallas. Outdoor sports are just as popular on a balmy mid-February day as in August. There are touches of winter, but snow is only occasional and even the roughest Januaries have their nice days.

While Dallas is known for its culture and urbanity, it is still a part of the West. There are dude ranches, as well as real ones, nearby. There's a Saturday night rodeo. Eating out in the open is a habit.

Visitors will find what they are looking for in the great and ever-expanding Dallas market. Dallas leads all cities of the Southwest in the number and variety of manufacturing plants and distributing facilities available for supplying the needs of the retail merchants and service establishments which look to Dallas as their buying center. Dallas has 2,500 manufacturers and 3,500 wholesalers. They produce and distribute everything from foodstuffs, textiles and apparel the heaviest machinery. Wholesale sales in Dallas average two billion dollars a year.

The Big Show

All this provides the stage setting. Now for the big show itself—details of the educational and entertainment program.

The educational program will be made up of up-to-the-minute presentations and discussions of subjects of interest to refrigerating engineers, including choosing air conditioning systems; concentration of foods by refrigeration; low temperature heat exchangers; cold storage plant maintenance and operation; refrigeration in refineries and breweries; humidity control by coil selection; practical suggestions to operating engineers; and a quiz session.

The tentative program as of to date is as follows:

Wednesday, Nov. 12, 1952

8:30 A.M. Registration and Meeting of Board of Directors.

10:00 A.M. Call to Order, President A. R. Carlson.

Welcome to Dallas.

Response, Walter E. Bernd, Sr.

Annual Reports, President, Secy., Treas.

2:00 P. M.

Choosing Air Conditioning Systems, Elliott Hallowell, Dallas, Tex.

Blower Coil Design and Selection for Proper Humidity Control, D. D. Wile, Los Angeles, Calif.

Testing and Rating of Blower Type Coils, F. Ed. Ince, St. Louis, Mo.

7:00 P.M. Bureau of Refrigeration Information, Chief Bureaucrat, Leo Vivian, New Orleans, La.

9:00 P.M. Men and Ladies Get Together.

Thursday, Nov. 13, 1952

9:00 A. M.

Refrigeration as Applied to the Concentration of Food Products, Joe Cross, Chicago, Illinois.

Factors Controlling the Choice of Freezing Facilities, Regis Gubser, Los Angeles, Calif.

New Low Temperature Evaporator Design, John Daly, Los Angeles, Calif.

2:00 P. M.

Modern Cold Storage Plant Design, Howard Peterson, Seattle, Wash.

Good Maintenance and Operating Procedure in Cold Storage Plants, Prof. Harold P. Hayes, San Luis Obispo, Calif., and Joseph Sullivan, San Jose, Calif.

3:30 P.M. Inspection of Alford Refrigerated Warehouses, Dallas, Texas.

7:30 P.M. Dinner Dance.

Friday, Nov. 14, 1952

9:00 A. M.

Refrigeration Serves Refineries and Refineries Serve Refrigeration, Humble Oil Co., Dallas, Tex.

Refrigeration on the Rails, LeRoy Etzel, San Francisco, Calif.

Modern Brewery Practice, Geo. B. Bright, Detroit, Mich.

2:00 P. M.

Changes to Ice Plant Evaporators which Brought About Greater Capacities, L. P. Reiss, Dallas, Texas.

Revamping Ice Plants to Automatic Operation, Eugene Rytlewski, Chicago, Ill.

The Stuff that Makes an Operating Engineer, H. G. Venemann, West Lafayette, Ind.

Business Meeting.

6:00 P.M. Board of Directors Meeting.

8:00 P.M. Stag party for men.

Theatre Party for ladies.

The lighter or entertainment side is in the capable hands of the Entertainment Committee, Tom Weatherford, Dallas, chairman, and this committee offers the information that this part of the program will come fully up to the high standards established by previous conventions. As of now, these entertainment features will be provided: Wednesday evening a get-together for members and ladies; Thursday afternoon, an inspection trip through the Alford Refrigerated Warehouses; Thursday evening the annual dinner dance; Friday evening a stag party for the men and a theatre party for the ladies.

California Company Wins Top Safety Honors

TOP HONORS in the 21st inter-fleet traffic contest, sponsored by the safety council of Sacramento, Calif., have been awarded to the National Ice and Cold Storage Company. The citation was for operation of trucks a total of 106,340 miles without accident. The period covered by the contest was the six months ended December 31, 1951. The company operates fifteen vehicles. During the ten and a half years existence of the Sacramento Safety Council, the company has won six first prizes in the fleet traffic contest.

N.A.P.R.E. Department

More on Question 922

ANSWER: Referring to Question 922 on the contamination of city water with ammonia, the following comments may be pertinent in addition to the published answer.

Contamination of public water supplies through cross-connections with industrial water supplies and process equipment is a more common hazard than often realized. Many local and state health department sanitary engineers have been alert to such danger points for many years. Others have been lax in discovering and correcting conditions until the "impossible" actually happens.

Where city water is delivered to equipment at a considerable height above street level, the average plant operator may be unaware of the many times that system pressure fluctuations cause temporary back flow. Average pressures in the city mains are obviously higher than the static pressure due to elevation, but surges may frequently cause lower pressures in the mains for short periods. Early recovery of normal pressure in the main will generally prevent drawing contamination clear back into the city system. However, heavy demands outside the plant, particularly for hydrant flushing or for fire department pumpers, may reduce pressure for long enough periods to pull water back from elevated services within the plant.

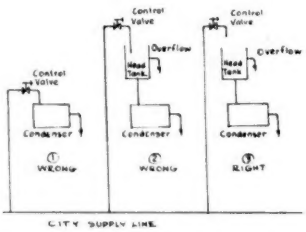


Diagram shows make-up connection for ammonia condenser.

If such a service happens to be connected to a leaky ammonia condenser, ammonia could be easily drawn into the city distribution system. This can be positively avoided by installing the make-up connection as indicated by arrangement 3 in the accompanying diagram, in which the end of the discharge pipe is cut off several inches or more above the top edge of the head tank.

Arrangement 2 is similar to arrangement 3, and would prevent back flow as long as the overflow line is free. However, if you have a plugged overflow, a full tank, a leaky control valve, contaminated water, and low pressure in the city system, all at the same time, you could have the sort of catastrophe described by R. P. M. It could not occur with arrangement 3.

Precipitation of solids as mentioned in the published answer would take place if ammonia should leak into a line carrying water with considerable bicarbonate hardness. In the same manner that lime will precipitate calcium carbonate in a water softener, ammonia will raise the pH value of the water, forming ammonium carbonate and converting the soluble calcium bicarbonate into insoluble calcium carbonate. This would tend to plug up a condenser, but would not be likely to cause back flow of contamination without a partial pressure failure in the city system.—K. M. Holaday.

N A P R E Question Box

H. G. Venemann, Professor of Refrigeration, Purdue University and chairman of NAPRE Educational Committee, answers members operating problems monthly in this column. Send questions to Chairman H. G. Venemann c/o Purdue University, West Lafayette, Indiana.

Thawing Water Line

Question No. 928. A 2-inch water line which runs diagonally under a corner of our ice storage room froze for the first time in over 20 years. The water had been shut off for about 10 hours. I have run a temporary line. Is there any way I can thaw it out without digging up the floor? — R. L. C.

ANSWER: The June 1947 issue of the National Engineer had an excellent article by R. F. Wyer on "How to Use Welding Equipment to Thaw Frozen Water Pipes." Mr. Weyer is with the Electric Welding Division of the General Electric Co., so his answer should be authentic.

The use of electric welding equipment to thaw frozen water pipes has been practiced successfully by a number of plant owners during the past few winters. Welding equipment offers advantages over other electrical means because it is self-regulating and can be accurately controlled. In addition, it is being put to good use in a season when it might otherwise remain idle.

No special equipment is necessary for doing this work other than reliable pipe clamps for making firm electrical connections. Strap-type clamps of copper, having ample section to carry several hundred amperes, are desirable. C-clamps may be used to clamp cable terminals directly to the pipe where necessary. A file, rasp, or abrasive cloth may be used to remove zinc oxide, rust, paint, and grease to assure a good electrical contact.

Cable should never be wrapped around the pipe as a connection, since it is practically certain to loosen, and may cause hazardous sparking. Ordinary pipe wrenches are required for disconnecting piping. A portable voltmeter is useful for checking voltage drops and determining the continuity of circuits.

The connections to the welding generator are made in the ordinary way with the work lead and electrode lead both connected to the pipe on opposite ends of the frozen section so that the heat generated in the pipe wall by the passage of current will thaw the ice in the pipe. The method

TABLE 1

Recommended Amperes	Pipe Diameter In Inches	Approx. Minutes to Thaw	Recommended Cable Size	Resistance per 100 Ft. Cable
¼	75	15	No. 6	.0395
½	125	20	No. 2	.0156
¾	200	20	No. 0	.00984
1	250	30	No. 00	.00780
1½	300	30	No. 000	.00619
2	350	40	No. 0000	.00491
4	600	75	400,000 cm	.00270
6	800	120	600,000 cm	.00180

TABLE 2 OHM RESISTANCE PER 100 FT. STANDARD PIPES

Pipe Diameter	Wrought Iron	Steel	Copper Tubing	Lead	Cast Iron Class A
½	.026	.0198	.00824	.0234	
¾	.0202	.01485	.00445	.01371	
1	.0138	.0100	.0034	.00984	
1½	.00842	.00618	.00208	.0064	
2	.00625	.0046	.00133	.0053	
4					.0092
6					.006

TABLE 3

Equipment	10 Volts	20 Volts	30 Volts	40 Volts
300-amp a-c welders	500 amp	450 amp	400 amp	375 amp
500-amp a-c welders	800 amp	750 amp	700 amp	625 amp
300-amp d-c welders	650 amp	600 amp	500 amp	400 amp
400-amp d-c welders	800 amp	750 amp	700 amp	600 amp
600-amp d-c welders	1200 amp	1000 amp	900 amp	700 amp

of getting at the pipe will vary in almost every case, but for economy, it is desirable to get as close to the frozen portion as is feasible without excessive digging in frozen ground. It is desirable to set the machine at the lowest current output adjustment at the beginning of a thawing interval in order to permit checking connections with the least likelihood of flashing.

While the proper current for thawing pipes has been established as between 200 and 500 amperes, the time needed to complete the job varies greatly according to the size, length, kind, and location of the pipe, condition of the surrounding soil, extent of the freeze, and temperature of the air. Tables I and II will help determine the various factors involved.

While the resistance given are for direct current, the reactance is so small that it can ordinarily be neglected when cables are not coiled. There are so many other variables in a given case that the voltage necessary to produce the current will be, for all practical purposes, the same for both a-c and d-c. Table III shows the maximum outputs which can be obtained from the arc welding equipment which would normally be used for pipe-thawing purposes.

Where welding sets are to be operated at less than 80 per cent of their ampere rating, the operation can be continuous. That is, a 40-ampere d-c set can be operated continuously at 320 amperes without damage. Likewise, a 500-ampere transformer can be operated at 400 amperes continuous. The sets may be operated at their maximum output for intermittent periods up to 15 minutes if sufficient time is allowed for return to normal temperature.

When using arc welding equipment for thawing purposes, there are a number of precautions which must be observed. If a good, low-resistance joint is not obtained between the copper cable and water pipe, excessive heat will be generated at the connection. If the current is allowed to form an arc at this point, it may damage the pipe.

Care should be taken to select the correct amount of current where there is known to be lead in the service pipe, because lead pipes will stand less current than iron. The pipes should be disconnected from the building piping before the wiring so that the current has only one path in which to travel—through the section which is frozen. If this is not done, where other devices are grounded to the water pipes the ground wires may burn out and cause a fire, since the grounding connections will be raised above earth potential.

In using single-operator d-c sets, two points should be noted. The low load voltage will result in the possibility of unusually heavy currents on the lower taps. Since these taps are designed to carry the low currents which will be drawn at normal operating voltages, the result may be to overheat portions of the series field. This can be avoided by setting the units on the highest tap and lowest open-circuit voltage which will give the desired current.

In addition, the low load voltage should be considered in making an estimate of the current setting required. Since load voltages in the neighborhood of 5 or 6 volts will often be encountered, the output current on any setting will be as much as 1½ times the current which would be drawn by a welding arc. With transformers, however, the current drawn by the load will be very nearly that indicated on the nameplate.

As a final precaution, the resistance of the joints in the pipe should be determined. If the joints are insulated by rust or pipe dope, a spark may start a fire.

Engine Horse Power

Question No. 929. How can I figure the horsepower of the Corliss engine which drives my compressor. It is a horizontal double acting engine, 15 inch bore and 18 inch strokes speed, 120 rpm. The ammonia compressor is also horizontal, 10½ x 18. The engine and compressor are direct connected. Suction pressure 20 psig, head pressure, 185 psig.—A. F. G.

ANSWER: Unless your engine is equipped with indicator cocks and a reducing mechanism for taking indicater cards at both ends of the steam cylinder, you can not figure the actual horsepower, but will have to depend upon the manufacturer's rating. If it is equipped for taking cards, and you have a steam engine indicator you may figure the horsepower by proceeding as follows:

Several sets of cards should be taken from each end of the cylinder. Each set should be taken at approximately the same time. The several cards from the head end are used to obtain an average value of the mean effective pressure in lbs per sq in. of the head end, and likewise those taken from the crank end are used to obtain the average value of mean effective pressure of the crank end. The horsepower of the head end is figured separately from that of the crank end by the use of the equation

$$hp = \frac{plan}{33000}$$

p=mean effective pressure, psi
l=length of stroke in feet, 1.5
a=area of piston, head end 176.71 sq in., crank end 169.65 sq in.
n=revolutions per minute, 120
33,000=constant for converting ft lbs per min into horse power.

NAPRE Department

The crank end piston area is always smaller than that of the head end by an amount equal to the cross-sectional area of the piston rod, which I assumed to be 3 inches in diameter.

The mean effective pressure, p is obtained from the indicator card by multiplying its average height in inches by the scale of the spring used in the indicator.

When operating at the pressures specified, the head end horse power should be about 41 and the crank end horse power about 39.

I think that the principal advantage of taking indicator cards is to observe the timing action of the values as they pertain to the events of the cycle-admission, cut-off, release and compression. If you have a steam indicator you should learn how to use it. By proper valve setting an engineer can easily save his salary during the course of a year.—H. G. Venemann

Heat Content, Total Heat,

Question No. 930. I have been studying psychrometric charts. One of them uses the term *Heat Content*, another uses *Total Heat*, a third uses *Enthalpy*, and a fourth uses *Sigma Heat*. Do they all mean the same thing? If not, will you please explain the difference between them? — M. E. W.

ANSWER: Three of the terms, *heat content*, *total heat* and *enthalpy*, all have the same numerical values and usually have the same meaning, but *Sigma Heat* has slightly smaller numerical values and a slightly different meaning. All of the terms express the amount of Btu possessed by one pound of air above zero degrees F, plus the Btus in the water vapor present in the mixture.

The difference between the Btu value of the first three terms and that of the Sigma heat lies in the Btu attributed to the water vapor at the dry bulb temperature. Sigma heat uses only the *latent heat of evaporation* at the dry bulb temperature, while the other three terms use the *latent heat of evaporation* at the dry bulb temperature plus the *sensible heat of the liquid* above 32 degrees.

In most air conditioning problems involving human comfort the Btu difference is very small and often disregarded, but scientifically there is a difference. For fuller explanation, refer to Lesson 12, Refrigeration Theory and Applications.—H. G. Venemann.

N.A.P.R.E. Department

New Questions

Calculating Tonnage of Brine Cooler

Question No. 931: Is there a better formula for calculating the tonnage of a brine cooler using calcium chloride brine than the one shown below? —E. M.

$$\text{Tons capacity} = \frac{\text{Gallons brine pumped} \times \text{TD} \times 8}{288000}$$

Btu Loss

Question No. 932: What is the difference in Btu loss per 24 hours between two shell and tube brine coolers, Nos. 1 and 2?

Cooler No. 1, 42 inches diam., 14 feet long, horizontal, full flooded, ammonia, suction pressure, 5 inch vacuum; inlet brine—23 F, outlet—26 F; room temperature 80 F; shell insulated with 3 inches hair felt, heads insulated with 3 inches cork board.

Cooler No. 2, 48 inches diam., 18 feet long, horizontal, full flooded ammonia, all temperatures same as in No. 1. Shell and head insulated with 8 inches cork board.—F. K.

Suction Pressures

Question No. 933: When operating on two suction pressures, O psig and 15 psig, is it better to use two compressors than one multiple effect compressor?—M. S.

News Notes and Chapter Activities

New Orleans

LEO J. VIVIEN

THE refrigeration course by Guy King is on in earnest, and the attendance and interest is high. Professor A. M. Hill, head of Mechanical Engineering at Tulane University, our instructor, is doing a splendid job and is bombarded by questions at all sessions. The course has been supplemented by various members bringing to the meeting, and explaining the use of certain valves and instruments which are mentioned in the course. They show the practical application of this equipment in their own plants and have materially assisted the general membership in a more thorough understanding of the course. The chapter is indebted to B. Mancuso, D. Selph and L. E. Blanchard for the assist.

Chapter No. 4 was completed at the May meeting, and it was decided to discontinue the course for the summer months, especially since our instructor, Prof. Hill, expected to be at the General Electric Company all summer.

Educational Chairman, F. Chase, arranged for additional diversions in addition to the course and the members enjoyed a trip to Cuba, West Indies and Jamaica via color film travalogue, courtesy of the Chicago Southern Air Lines. Two self-explanatory films on the manufacture of gold and silver articles, through the courtesy of D. Fisher proved quite interesting.

The business sessions of the meetings were short during this period, due to a well filled educational program. However, President Mancuso appointed L. Vivien, chairman of the Data Book Committee with F. Gillio, T. O'Connor, V. Foret and F. Chase as members. With the assistance of other members of the Chapter we were successful in obtaining fifty-four (54) quarter page advertisers locally, and a couple of pages of national advertisers.

The members were impressed with the knowledge that advertising in our Data Book would enable the National Office to function better and secure better material for the publication. While securing ads we also advertise the activity of our local group, and the publicity can do us no harm.

For entertainment the Quarter Club, a fun loving group within the Chapter, met twice and their main business was eating, refreshments and general good-fellowship. The June 25 meeting was arranged by the Entertainment Committee, and the principal business was the eating of our famous shrimp, crabs and the drinking of beer and soft drinks. Over 100 members attended and thoroughly enjoyed themselves.

Educational Chairman Chase continued the educational program for the summer with diversified subjects. June 11, Miles Hudson, engineer for the Industrial Electric Company of New Orleans, delivered a lecture on motors and motor controls, supplementing his talk with a color film on motors by General Electric. The lecture proved quite interesting and many important phases of motor control and motors were explained.

The July 9 meeting was well attended when Chester Keating of the Standard Brass Co. arranged for a lecture by the Minneapolis Honeywell Regulator Co. of New Orleans district, on boilers and air conditioning controls. Mr. Ridley, manager of the district office, first demonstrated an electronic flame rectifier burner control system, and pointed out that the main function of any combustion safeguard is to prevent continued flow of unignited fuel into the combustion space, in the event of flame failure or failure of ignition.

The question of safe failure was raised and answered with several eye-opening demonstrations of the Honeywell system. First the pilot flame was ignited by the ignition coil, then a stop-start push button station and the main flame was ignited in a split second as the pilot flame was proven to the vacuum tube, enabling the relay to open the main gas valve. Without the pilot flame the main valve will not open.

It was shown that if both main and pilot flames are extinguished during a run that one attempt to re-ignite the pilot is made (with the main valve closed) and if the flame is not re-established, or not established at the start, the system shuts down on safety. The safety switch must then be reset manually before re-starting. In the event of a vacuum tube failure, the system will immediately shut down safe.

Mr. Ridley next demonstrated an electronic air-conditioning control system which is a fast acting modulating system, used to control valves, dampers, etc., in turn determining the amount of cooling directed to the space in question. The electronic thermostat contains 500 feet of alloy metal wire of low density, has no moving parts to wear.

A thermostat as described above was enclosed in a plastic cylinder and upon breathing on this thermostat an electronic motor in the circuit was made to rotate in one direction when inhaling, and in the other direction when exhaling, illustrating the speed with which a controlled member can be actuated with the slightest temperature change in the presence of an electronic thermostat.

A point brought out is that the electronic panel, the heart of the control system provides a central panel from which all adjustments for control are made. Installations which use outdoor reset for temperatures, always require adjustments after original installations to match actual job conditions. This provides exactly the kind of central panel an operating engineer desires.

A chart with wet and dry bulb temperatures recorded as controlled by Honeywell controls was passed around for everyone to see the results of an actual installation in Louisiana. It was noted by all that the variables controlled looked to be anything but variables, for their valves remained very constant at the valve set by the control. Mr. Ridley then answered many questions propounded by an interested group.

Our membership drive has been moving along. Not as good as we would like, but now that the solicitation of ads for the Data Book is over, more time will be devoted to member procurement.

Our good friend and brother member, Ray Burnett of Los Angeles Chapter seems to be of the opinion that a few chapters (as mentioned in the June issue of ICE & REFRIGERATION) are holding back members and expect to lower the boom on him in Dallas come November. We thank Ray for the needling, and promise him that if the boom is lowered on him by us, it will be done gently and with brotherly tenderness. We have no hold-backs at present, but a sincere intention to move forward from here on until the contest ends.

The Chapter was saddened by the death of a good friend and long time member, Fredrick J. Schuber, June 9, 1952. Fred was for many years very active and contributed much of his time and splendid abilities toward the betterment of the chapter. His leadership and sincere friendship for the members and aims of the N.A.P.R.E. serve as an inspiration for those of us who remain.

Los Angeles

FRED HERR

THE months of July and August, while regarded as a "vacation" period during which no regular meetings are held, was nevertheless put to good purpose by Los Angeles NAPRE Chapter, mainly in the way of efforts to keep the membership drive from lagging during the off-season.

Membership Chairman W. R. Burnett of the Royden Ice Company reported to ICE AND REFRIGERATION on August 5 that the unabated summer work of Los Angeles members permitted him to say, without much fear of successful contradiction from other sectors of the NAPRE front, that Los Angeles ". . . has got it in the bag and the drive is all over insofar as Dallas, San Francisco, New Orleans or anyone else is concerned."

Burnett reported that the signed applications of 15 new members were definitely on hand on that date, with some 15 more ready to be turned in for processing at the September 3 Ham and Beans Dinner, which touches off the chapter's fall activity program. Additionally, according to Burnett, there has been some concentrated work on renewals. Incomplete returns on this phase of work indicates, he declared, that credit for approximately ten more members will be obtained from that source. The membership committee chairman estimated early in August that about 40 new members would be ready for chapter approval when the entire summer's work is recapitulated at the September 3 meeting, bringing total chapter membership to 326, just a few short of its all-time high of 333.

A joint conference of members of the educational, entertainment and attendance committees was held in mid-July to discuss and prepare an expanded program of activity for the various committees during the balance of 1952 and in 1953. Nomination of delegates for the Dallas convention was also discussed.

Present at the conference were President Edgar M. Marrs, treasurer E. T. Quinn, secretary Donald H. Byl; Ed L. Nelson and Frank Eccleston of the entertainment committee; Rudi Kettler and William Frank Muzzy, entertainment committee chairman; W. R. Burnett and R. L. Maple of the membership committee.

The group decided to recommend subject to final approval of the chapter at the next meeting, that four delegates be sent to the national convention in Dallas, instead of three as in past years. Recommended for delegate duty were Degis Gubser, Quinn, Byl and Burnett.

The joint committeemen also recommended expansion of the chapter's special dinner night series by sponsoring four dinners with entertainment during each fiscal year.These would consist of the current Ham-and-Beans dinner on the first Wednesday in September; Old Timers Night on the last meeting night in June; plus a Farewell Dinner in December to close out the calendar year; and a Stir-Up Dinner early in February in the form of a rally to introduce new officers.

The chapter's 1952 Fall Series of meetings was scheduled to be launched on September 3 in the Terminal Club with the Ham and Beans Dinner which through the years has become a traditional affair. Ed L. Nelson and his competent entertainment committee, as usual, prepared a top-flight entertainment program, which was to be presented in the auditorium of the Terminal Club.

Seattle

JAMES BENNETT

IT IS with much regret that we report the death of one of our charter members, James R. Cummings. Mr. Cummings had lived in Seattle since 1906. He was born in Fayetteville, Tenn. He was a loyal member of the NAPRE and very diligent in his attendance at meetings up until the time be became ill. He will be greatly missed. He is survived by his wife, Edith, and two brothers.

We recessed our meetings for the summer period but will begin to meet again regularly in September.

Membership Note

A NUMBER of chapters have recessed for the summer months. That does not mean, however, that there has been a lag in membership building. They have continued to plug away during the vacation period. New members and renewals have continued to come in during the summer lull. A report on the membership drive will be published next month.

Twelfth Edition Operating Data Book

THE twelfth edition of the Operating Data Book is on the press and will be distributed to the membership of the NAPRE early in September. Due to the untimely death of our faithful secretary, Emerson Brandt, the publication of the Operating Data Book has been delayed. This 1952 edition is quite similar in general format to previous issues with completely different material on a variety of refrigeration engineering subjects. All of the excellent papers given at the last convention in Memphis have been consolidated under one cover. Much of this material concerns itself with air conditioning problems of design and of operation.

Donald Glaspie's article discusses in detail the various factors from which an air conditioning load may be determined. Professor Venemann has outlined several methods whereby an air conditioning system designed for full load may be operated at reduced load during muggy weather.

E. R. Hallowell discusses very thoroughly problems which confront the operating engineer in cases where the air condition load exceeds designed capacity of the refrigeration plant. Gerald E. Hicke's paper on "The Modern Refrigerating Machine" discusses in a very entertaining manner the various features of compressor design which have been brought about by the ever increasing demands of industry for refrigeration machinery. He mentions for example, such improved features as reversible oil pumps, low tonnage centrifugal compressors.

All plant owners will be interested in the discussion on "How to Keep Power Costs in an Industrial Plant at a Minimum." They will also be interested in learning how public relations may be improved by the use of appropriate placards displayed in the engine room, and by good housekeeping.

The paper by C. T. Baker should be of particular interest to plant owners and operators because in it he puts his finger directly upon the spots which have caused losses in income and often business failure. We do not want any of our NAPRE operating engineers to be guilty of similiar practices.

Several unique features of design in freezer plant construction are discussed in Don A. Parkhurst's article. William J. Finnegan who has done very extensive research and experimentation on food freezing illustrates and discusses several methods whereby the best results may be obtained in this work.

The annual Question Box will again be one of the much used features of the 1952 book. Most of the questions which have been presented during the past year are incorporated and will serve for subjects of discussion at chapter meetings as a part of the educational programs.

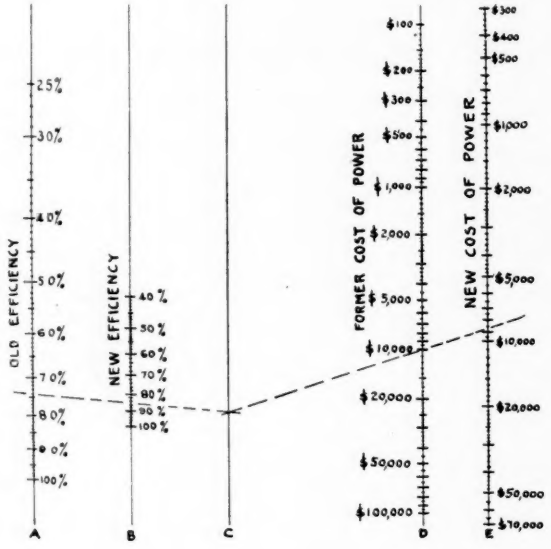
A greater number of advertisers appear in this issue than in any previous year. A Buyers' Directory is published for the first time and it serves as a ready reference to the most important materials and services the advertisers have to offer.

A copy of the Operating Data Book is furnished free of charge to all association members. For chapter members, the book is distributed through the chapter. The national office distributes the books to members-at-large.

ENGINE ROOM POINTERS –

Chart Shows Dollar Value of Higher Machine Efficiency

THE accompanying chart will be found useful by plant executives, engineers, and mechanics, for determining the savings that are possible by increasing machine efficiencies. This may be accomplished in two ways: By removing the old machine and installing one having higher efficiency, or, by increasing the efficiency of the old machine, if possible.



To use the chart, simply zig zag two straight lines across as indicated by the dotted lines and the saving is found by subtracting the figure in column E from that in column D.

For example, let us say that your present water pump has an efficiency of 74 per cent and that it is proposed to install a new or improved pump having an efficiency of 85 per cent. The cost of electric power at present is $10,000 per year. How much money will be saved by installing the pump having the higher efficiency?

The dotted lines show how it is done. Run a line through the 74 percent, column A, and the 85 percent, column B, and locate the intersection with column C. Then from that point of intersection run through the $10,000 in column D and it will be found that the line cuts column E at $8,700. This means that the new pump will operate at a cost of $8,700 per year for electric power as compared with the present cost of $10,000 per year. Subtracting $8,700 from $10,000 the saving therefore will amount to $1,300 per year.

There is no limit to the range of the chart as regards price or cost. Thus by simply adding ciphers to the figures in columns D and E the same dotted line tells us that if the former cost is $100,000 the new cost will be $87,000. Or if the former cost is $1,000,000 the new cost will be $870,000. And so on. And where the costs are less, simply subtract ciphers. Thus if the former cost is $10 per year three ciphers are removed from the figure in column D and we therefore also remove three ciphers from the figure in column E and the answer is $8.70. In other words, add as many ciphers to the figure in column E as you add to the figure in column D, or, if deducting, subtract as many ciphers from the figure in column E as you deduct from the figure in column D.

The motive behind the chart is to emphasize the money value of higher efficiencies. First cost, of course, must be given consideration as well as efficiency. This it may not pay to buy the pump having the highest efficiency obtainable whereas it will pay well to install a standard pump of reasonable price having an efficiency considerably higher than that of the old pump. The example cited above —74 percent and 85 percent—is typical of improvements that are commonly and profitably being made at the present time—S.W.F.

Predictions of Other Days May Now Seem Foolish

A GOOD many years ago—in the neighborhood of 1916 — there were dire predictions regarding our waning and meagre supply of oil remaining in the ground. The secretary of the interior himself said that there were less than eight billion barrels of petroleum remaining in the ground. Yet, since that time, this country has produced several times that quantity of oil and we know that considerable oil still remains in the ground. Predictors, though, are still predicting that our oil is nearly all gone.

In 1916 we were told that leather belting would soon be "out of the picture." Substitute belting was coming along rapidly. The remarkable V-belt was not even heard of at that time. Yet, the leather belt is still with us occupying a very prominent place.

The writer has before him an article published in 1914 in which the author said that a 16,900 kw steam turbine would be big. He said, ". . . the practical limit for a turbine running at 750 rpm is probably about 25,000 kw." And from the same article: "An attempt to get 48,000 kw out of the turbine with a 29 in. vacuum, however, would be futile."

This writer himself, back in 1923, said: ". . . engineers will eventually settle down on about 600 pounds as the economical maximum steam pressure." The only redeeming feature about that prediction is the word "eventually."

The moral is: Before you do any predicting, think twice. The chances are that you will be wrong. Even the great Steinmetz, you know, predicted that by 1926 "the gasoline car will be relegated to the limbo of things outlived."

FrozenFoods
*Reg. U. S. Pat. Off.
PREPARATION PACKAGING FREEZING STORAGE DISTRIBUTION DESIGN CONSTRUCTION EQUIPMENT

Maintaining Temperature of Orange Juice In Storage and In Transit

FOR members of the carrier, storage and distribution industries, a booklet has been issued by The Minute Maid Corp., Plymouth, Fla., calling attention to the importance of maintaining proper temperatures in storage and in transit from production centers and to marketing destinations; and in the consumer's home.

As a result of research, the booklet states, they are convinced that the temperature of concentrate during transit and storage should be held to at least 0 F. At that temperature the physical and chemical changes taking place in the concentrate, while not stopped entirely, are held to a minimum. Damaging changes affecting both stability and flavor take place at an ever increasing rate as temperatures rise above this level.

During its journey from the plant to the consumer, frozen concentrate is subject to damage at the following points:

Storage at the Plant
In Transit
Storage in Public Warehouses
Handling in Retail Outlets
Storage in the Consumer's Home

Storage at the Plant

At this point Minute Maid has full responsibility. We have made heavy investments to control the temperature at this stage. We have votators, quick freeze units, and adequate refrigeration capacity to do a thorough job. The capacity of our votators and quick freeze units is sufficient to bring product temperature in 6 oz. cans down to 0 F within 12 minutes after it is sealed in the can, and within approximately an hour in 32 oz. cans.

After being packed, the product moves rapidly along automatic mechanical conveyors to freezer storage where we have adequate capacity to hold temperatures down to approximately minus 15 F. Cases are stacked on pallets in a pattern that assures a continuous blast of cold, sub-zero air circulation around each separate case. Product remains at this point for at least one week. Thus it is certain to be in excellent condition when delivered to the carrier.

In Transit

Why is low temperature so important during the transit period? Any rises in temperature that occur during the transit period are probably never overcome thereafter. The function of a public freezer storage warehouse is to maintain temperatures of 0 F or colder. Storage warehouses as such are not expected to do a quick freezing job. Numerous tests have indicated that product stored in large lots in these warehouses does not normally recover from temperature rises in transit.

Only the outside cases are exposed to temperature differentials. Even these cases, if they have suffered temperature rises, fall very slowly toward the storage room temperature. We have found that it takes several weeks for these outside cases to reach 0 F again. Inside cases will probably remain at the stored temperature, whatever it may be, for several months. Consequently, serious degradation may take place if high temperature product is delivered to the storage warehouse by the carrier.

There is then only one logical answer to the question of whether a particular carrier unit is entirely suitable for hauling concentrate and that is to actually check its performance and determine beforehand that it can bring its air temperature down to 0 F.

In shipping from our plants and primary storage points, our traffic department makes every effort to use either rail or truck equipment with at least six inches of insulation and equipped with suitable mechanical compressor units capable of maintaining air temperatures of 0 F or colder.

We realize that the concentrate industry is growing and expanding at a lively rate. The demand for good transport equipment is heavy and the supply is still short. However, both rail and motor carriers are adding more and more units that meet our standards. These good mechanically refrigerated units should be used whenever they are available, especially when shipping to central storage warehouses where the product may remain for several months.

Whenever mechanically refrigerated rail equipment is not available because of heavy demands, the best salt and ice car equipment available should be used. All such refrigerator cars furnished for our use by the railroads must have at least six inches of insulation, must have been properly pre-cooled and properly iced with 30 percent salt added, must have good floor and side wall racks, and in a good condition of repair.

Truck Trailers

Tests indicate that truck trailers with only four inches of insulation when equipped with heavy duty compressor units, can maintain 0 F under ideal conditions. However, we need the added factor of safety provided with six inches of insulation to retard temperature rises when the mechanical unit fails — and fail it does occasionally.

Our experience with trucks using blocks of dry ice alone, with or without blankets, has, on the whole, been unsatisfactory. We do not recommend this method of refrigeration except for emergencies on the road when the mechanical unit has failed, or for very short hauls, or as a booster with a good mechanical unit.

Industry studies show an average product temperature of 15.5 F on arrival for a truck using dry ice refrigeration, not pre-cooled, loaded at night. A temperature of 5.8 F was recorded for a truck using mechanical refrigeration plus dry ice, precooled, loaded at night. The practice of using both dry ice and mechanical equipment is strongly recommended during the summer months.

All railroad cars and trailers should be properly pre-cooled before loading. They must be equipped with floor racks and side wall racks. No temperature, however low, can protect cases stacked against plain smooth walls or floors, unless the type of construction permits circulation of cold air on the opposite side of this smooth surface.

It is strongly recommended that distributors, especially those concerned with long hauls, check with Minute Maid's Traffic Department before sending trailers that do not meet the above specifications, to pick up product.

Storage in Public Warehouses

Minute Maid Corporation selects for primary storage only those public warehouses that assure freezer temperatures of 0 F or colder. Distributors (and carriers in emergencies) should take the same precaution in the selection of storage facilities.

Loading and unloading operations at the warehouses should be carried out in a manner that assures the least possible rise in temperature at this point. The condition of the load on arrival should be carefully noted. Any evidence that the temperature of the product is not within a safe range for long storage should be reported to Minute Maid's Traffic Department promptly.

In the storage room, the product should be stacked on pallets or wooden strips to get the cases at least four inches off the floor. It should also be stacked at least six inches away from the side walls.

A very frequent cause of product damage in warehouses is the temperature of the breakup room. Temperatures here have been found to range from 0 up to as high as 40 F.

A breakup room temperature of 10 F is considered the highest temperature consistent with safeguarding quality of product, and product certainly should not be allowed to remain at this temperature for protracted periods of time.

Handling in Retail Outlets

Minute Maid is working intensively to improve the handling of frozen concentrates by retailers. We are doing everything possible to advise retail personnel concerning:

(a) Proper storage (see above).

(b) Proper handling in the breakup operation.

(c) Minimum time for storage to display cabinets.

(d) Proper types and temperatures of display cabines.

(e) Proper positioning in display cabinets—not above the safe level, nor against the front of glass display cabinets. Product should be in the cabinets.

Concentrate is not safe when displayed at temperatures in the 15 to 25 F range sometimes considered adequate for other frozen foods.

Our sales department has also worked intensively with manufacturers of various freezer dispenser cabinets to develop a unit that will do a better job for frozen concentrates. Much has been accomplished in this field. Thousands of improved cabinets are now in operation, and others will be installed as quickly as they can be manufactured.

Storage in the Consumer's Home

Liberal amounts of money are being expended through various advertising media to educate the consumer to handle the product properly in the home. Customers are continually advised not to place the can in the general storage section of the refrigerator, but in the freezer compartment or in a deep freeze unit.

Small Cans for Frozen Foods Speed Packaging

POSSIBLY the most noteworthy event in frozen-fruit packing this year is the trend toward use of the small can, according to a recent bulletin of the Refrigeration Research Foundation. Examples are frozen berries in the Northwest and pineapple chunks in Hawaii. A can holding the same amount of fruit as a given rectangular package requires much less syrup to cover the fruit adequately. Thus the packer packs more fruit and less sugar which the consumer can supply. Can-filling equipment moves several times faster than carton-filling machinery. Thus, the way may be open for further development of immersion freezing.

The effects on general level of quality remain to be seen, but they will probably be good. Effects on general "warehousability" will probably be good, too. Those who have been close to technical frozen-food developments have been aware of these advantages for a long time and it is encouraging to realize according to the director, that the industry is now in a position to promote this important development.

Studies Show Effectiveness of Anti-Bacterial Concrete

THE bulletin of the Refrigeration Research Foundation in a recent brief review of anti-bacterial concrete says that "Floor and wall cements that will do a job of killing or controlling harmful bacteria and molds, along with antiseptic paints, offer the possibility of much advantage and, of course, there is much research under way toward this objective. A basic question is the durability of the effect on micro-organisms as well as their appropriateness for establishments handling food.

Recently the conclusion reported in a British Journal was announced that a hard glossy-smooth surface should be a primary objective because it collects less dust, which feeds molds and is easier to clean. It seems reasonable to assume that any antiseptic effect in a surface must come from a chemical that is slowly released and will be durable only as long as the supply lasts.

"David Levowitz, New Jersey Dairy Laboratories, New Brunswick, N. J., has a quite encouraging report in Food Engineering for June, 1952, on a new cement for which the patent holder is North American Cement Corporation, 41 East 42nd Street, New York City. Some 20 cases of success in plants are reported—fish processing, dairy processing, breweries, swimming pools and others. It is stressed that this cement (called ABC, for Anti-Bacterial Cement) will not disinfect an accumulation of debris; its effect is limited practically to the molecular layer of contact. Thus it aids cleaning. It is stressed also that for heavy-duty masonry, the recommendations of the Portland Cement Association must be followed to the letter.

"In this connection, it is well to mention research reported in Industrial and Engineering Chemistry for September, 1951, by R. F. Robinson and C. R. Austin, conducted at Battelle Memorial Institute, Columbus, Ohio. More than 20 additives of copper or copper compounds were used in concrete. Concrete containing 10 percent of copper aceto-arsenite was very effective. The additives lowered the strength of the concrete but not enough to limit use as a finishing layer and the authors state that copper-portland cement could be used practically as a flooring in locker rooms, around swimming pools, in industrial kitchens or wherever a sanitary environment is important. They found that the effect on common molds was temporary in nearly every case and the reason may have been lowering of concentration of inhibitor at the surface or perhaps acclimatization of the mold to the copper in the compound."

Put Sign on Building

(Continued from page 18)

every prospective customer at just the right time. This method of using a building to sell services and goods comes nearer to reaching that goal than many other methods, and it can accomplish this with only a small original outlay and no constantly recurring expenditure.

Cost is Nominal

The only cost after the sign is once put on the building is in a yearly repainting job for it is of great importance that such a sign always have a fresh and clear appearance. A shabby looking sign gives everyone the impression that ours is a shabbily run business—certainly no inducement to spend their dollars with us.

No ice manufacturers building should ever be left blank or carry a simple identification only—using it to help sell our business costs so little and brings such big results the opportunity should never be overlooked.

Heat-Treated Eggs

"THERMOSTABILIZED" shell eggs (eggs bathed in hot oil for a short time to maintain their quality during storage) were found to be acceptable to more than 92 percent of the consumers who used them, in a study made in a large southern city (Birmingham, Ala.) by the Production and Marketing Administration, U. S. Department of Agriculture.

Previous studies, made by the Poultry Branch of PMA, showed that thermostabilized eggs retain their quality much better in storage than eggs treated by the usual cold oil process. After 7½ months' storage, 84 percent of the thermostabilized eggs were still Grade A or better, while only 37.8 percent of those treated with cold oil were still Grade A.

The study of consumer acceptance of thermostabilized eggs was made in cooperation with four supermarkets, under authority of the Agricultural Marketing Act of 1946 (RMA, Title II), to learn whether homemakers would buy and like the eggs so treated. There was practically no difference between the consumers' approval of thermostabilized eggs and their approval of those treated with cold oil as is done commonly by the trade. Acceptance of untreated eggs was almost 100 percent, or about 8 percent higher than for the thermostabilized and cold oil processed eggs.

The homemakers reported little difference in their acceptance of thermostabilized eggs.

Book Review

FOOD SCIENCE, A Symposium on Quality and Preservation of Foods, By E. C. Bate-Smith and T. N. Morris. Published by Cambridge University Press, New York. Illustrated. 320 pages. Price $8.00. For sale by Nickerson & Collins Co., Chicago, Ill.

This is a symposium of twenty-six authorities on the science and practice of storing, preserving and transporting food between production and consumption, offered as the first English book to deal with the subject comprehensively. It's basis was a series of summer lectures on food science at the University of Cambridge in cooperation with the Low Temperature Research Station. The lecturers rewrite their contributions in forms more suitable for publication and complied with other editorial restrictions. The result is a collection of lectures by contributors, each of whom is an authority in his own field.

Certificates of Tax Amortization Granted

CERTIFICATES of necessity for tax amortization purposes covering new investment for expansion have been announced by the Defense Production Administration in an industry summary. During the period between April 15 and June 20 the following have been issued:

Refrigerated warehouses, 26 plants with proposed investment of $17,141,000, of which $9,440,000 or 55.1 percent has been allowed. In addition, one request with $110,000 proposed investment is pending.

One ice manufacturing plant with proposed investment of $51,000, of which $13,000 or 25.5 percent has been allowed.

Two frozen fruits, vegetables and sea foods concerns with proposed investment of $485,000, of which $116,000 or 24 percent has been allowed. In addition, one request with $265,000 proposed investment is pending.

Nine refrigerators, refrigerating machinery and air conditioning units with proposed investment of $4,073,00 of which $3,232,000 or 79.4 percent has been allowed.

Canadian Railways New Refrigerator Car

A NEW type of mechanical refrigerator car has been constructed by the Canadian National Railways. The new car underwent standing tests, and on its running tests the temperature is expected to dip to 10 below zero, said to be 15 degrees lower than the average temperature in standard refrigerator cars.

Taxes Head for Stratosphere

THIS graph issued by the Chamber of Commerce of the United States shows how federal taxes have jumped 1,072 per cent in the past 12 years. In 1952 they amount to $1,389 for each family as compared to $1,196 in 1945 and $152 in 1940.

New Control Laboratory For Testing Equipment

A NEW control laboratory costing $250,000.00 has been installed by the Perfection Stove Company, Ohio, for the purpose of testing internal combustion engines and lubricants, metals and heating devices at ultra cold temperatures. The laboratory has walls of 12-inch rock cork. The room is 60 by 60 feet. It is refrigerated by three Brunner compressors operating in a two-stage system with Freon-22.

It can be brought down to minus 90 F. Automatic temperature controls keep the room within two degrees of the desired temperature. Six-ply thermopane windows keep the cold in, while allowing test work to be seen from the outside. The air can be completely changed in 30 seconds by two circulators able to move 30,000 cubic feet per minute.

Air Conditioning Unit New Auto Feature

ONE of the major engineering advances in 1953 model automobiles undoubtedly will be General Motors' new air-conditioning unit. It has announced the device, to be manufactured by its Frigidaire division, will be available as optional equipment in Cadillac and Oldsmobile models next year.

Like many other postwar refinements in cars, air conditioning is not new. Packard had it as optional equipment in 1938 and 1939 but discontinued it because prices at that time were regarded as prohibitive.

Presumably General Motors has developed an air conditioning device for automobiles which can be provided at a price that it believes will be of interest to prospective purchasers of new car models.

CONVENTION CALENDAR

FLORIDA ICE ASSOCIATION
October 12-14, 1952
Hotel Floridan, Tampa, Fla.
MURIEL WASHBURN, Secretary

CANADIAN ASSOCIATION OF ICE INDUSTRIES
October 21-22, 1952
Chantecler Hotel, Ste, Adele, Que.
MILDRED CROFT, Secretary

NATIONAL ASSOCIATION OF ICE INDUSTRIES
November 11-14, 1952
Netherland Plaza Hotel, Cincinnati
GUY W. JACOBS, Exec.-secy.

NATIONAL ASSOCIATION PRACTICAL REFRIGERATING ENGINEERS
November 12-14, 1952
Adolphus Hotel, Dallas, Tex.
A. R. CARLSON, President

DELTA STATES ICE ASSOCIATION
November 23-25, 1952
Hotel Heidelberg, Jackson, Miss.
R. N. MILLING, Secretary

GEORGIA ICE MANUFACTURERS ASSOCIATION
February 24-25, 1953
Ansley Hotel, Atlanta, Ga.
RICHARD H. FLORRID, Secretary

SOUTHERN ICE EXCHANGE
February 24-25, 1953
Ansley Hotel, Atlanta, Ga.
RICHARD H. FLORRID, Secretary

ASSOCIATION DIRECTORY

AMERICAN INSTITUTE OF REFRIGERATION
H. T. McDermott, Gen. Secretary, 433 N. Waller, Chicago 44, Ill.

NATIONAL ASSOCIATION OF ICE INDUSTRIES
Guy W. Jacobs, Secy., 1706 L St., N. W., Washington 6, D. C.

NATIONAL ASSOCIATION OF REFRIGERATED WAREHOUSES
Wm. Dalton, Exec. Vice-Pres. Tower Bldg., Washington 5, D. C.

NATIONAL ASSOCIATION OF PRACTICAL REFRIGERATING ENGINEERS
435 N. Waller Ave., Chicago 44, Ill.

CALIFORNIA ASSOCIATION OF ICE INDUSTRIES
Jack L. Dawson, Secretary
461 Market St., San Francisco, Calif.

CANADIAN ASSOCIATION OF ICE INDUSTRIES
Mrs. Mildred E. Croft, Secretary
317 Eglinton Ave., Toronto, Canada

DELTA STATES ICE ASSOCIATION
R. N. Milling, Secretary
Ouachita Bank Bldg., Monroe, La.

EASTERN STATES ICE ASSOCIATION
R. H. Wilson, Secretary-treasurer
Delavan Ave. & Spruce St., Philadelphia, Pa.

FLORIDA ICE ASSOCIATION
Muriel Washburn, Secretary
1926 Silver St., Jacksonville, Fla.

GREAT LAKES CHAPTER, N.A.R.W.
Harry Foster, chairman
Cincinnati Terminal Warehouses, Inc.
Cincinnati, Ohio

ILLINOIS ASSOCIATION OF ICE INDUSTRIES
W. D. Wright, Secretary
Clinton Pure Ice Co., Clinton, Ill.

INDIANA ASSOCIATION OF ICE INDUSTRIES
Robert W. Walton, Secretary
Board of Trade Bldg., Indianapolis, Ind.

KANSAS ASSOCIATION OF ICE INDUSTRIES
Matt Scherer, Secretary
McPherson Ice Company,
McPherson, Kansas

KENTUCKY ICE MANUFACTURERS ASSOCIATION
R. T. King, Secretary
217 E. Main St., Louisville 2, Ky.

MICHIGAN ICE INDUSTRIES ASSOCIATION
Edward W. Jackson, Secretary
131 E. Kalamazoo Ave., Kalamazoo, Mich.

MISSOURI VALLEY CHAPTER, N.A.R.W.
H. A. Steinmeyer, chairman
Booth Cold Storage Co., St. Louis, Mo.

MISSOURI VALLEY ICE MANUFACTURERS' ASSN.
V. A. Esphorst, Secretary
3820 Washington St., St. Louis, Mo.

MOUNTAIN STATES ASS'N OF ICE INDUSTRIES
J. R. Espy, Secretary
Espy Ice Co., 2101-31st St., Denver 5, Colo.

NEBRASKA ASSOCIATION OF ICE INDUSTRIES
Frank Vogelsang, Secretary
W. T. Good Ice Co., Lincoln, Nebr.

NEW ENGLAND ICE ASSOCIATION
Raymond Wilber, Secretary
83 Winter St., Providence, R. I.

NEW JERSEY STATE ASSN., N.A.R.W.
Leo J. Fisher, president
Harborside Warehouse Co. Inc.
Jersey City, N. J.

NEW YORK STATE ASS'N REF. WAREHOUSES
Garth A. Shoemaker, president
Hygeia Refrigerating Co., Elmira, N. Y.

NORTH ATLANTIC CHAPTER, N.A.R.W.
Jerry Johnson, Chairman
Terminal Refrigerating & Warehousing Corp.
Washington, D. C.

NORTH CAROLINA ICE ASSOCIATION
Lewis H. Powell, Secretary
Capital Ice & Coal Co., Raleigh, N. C.

NORTH PACIFIC CHAPTER, N.A.R.W.
E. F. Swanberg, chairman
Diamond Ice & Storage Co.,
Seattle, Wash.

NORTHWEST ASSOCIATION OF ICE INDUSTRIES
L. F. Marsh, Secretary
1539 N. E. 37th Ave., Portland, Ore.

OHIO ASSOCIATION OF ICE INDUSTRIES
Elizabeth Shannon, Acting Secy.-Treas.
The Steubenville Ice Co., Steubenville, O.

OKLAHOMA ASSOCIATION OF ICE INDUSTRIES
Harry T. Hudson, Executive Secretary
525 Cravens Building 7, Oklahoma City, Okla.

PACIFIC STATES COLD STORAGE WAREHOUSEMEN'S ASSOCIATION
Jack L. Dawson, Secretary
461 Market St., San Francisco, Calif.

SOUTH CAROLINA ICE MANUFACTURERS ASS'N
Geo. L. English, Secretary
P. O. Box 603, Columbia, S. C.

SOUTH PACIFIC CHAPTER, N.A.R.W.
M. W. Young, Chairman
National Ice & Cold Storage Co.,
San Francisco, Calif.

SOUTHERN ICE EXCHANGE
Richard W. Florrid, Secretary
1135 Forsyth St. N. W., Atlanta, Ga.

SOUTHEASTERN CHAPTER, N.A.R.W.
W. B. Haggerty, Chairman
Tampa Cold Storage & Warehouse Corp.
Tampa, Fla.

SOUTHWESTERN CHAPTER, N.A.R.W.
C. P. Metcalf, chairman
Southwestern Ice & Cold Storage Co.,
Austin, Tex.

SOUTHWESTERN ICE MANUFACTURERS ASS'N
P. A. Weatherred, Secy. Counsel,
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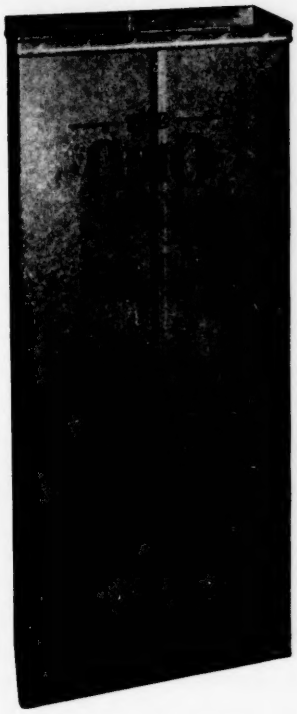

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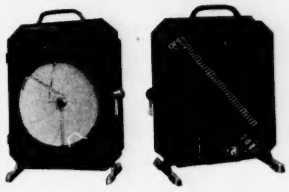

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DEATHS

Paul Barbaro

THE death of Paul Barbaro, pioneer and one of the last of the old timers in the Chicago ice industry, occurred July 26 in Henrotin Hospital, Chicago. Mr. Barbaro, who lived at 8019 Oglesby Avenue, Chicago, had been sales manager of the Jefferson Ice Company since 1942.

Paul Barbaro

Mr. Barbaro was born August 15, 1873 in Chicago and his entire life was spent in and around Chicago. At an early age he became a bat boy for the White Stockings, 1884 to 1886. He served through two championships won by that team in 1885 and 1886. About 1888 he was employed by the Daily News as a cub reporter and also in the engraving department. For the next ten years he was employed with a bicycle company and was captain and president of the Woodlawn Cycling Club.

He entered the ice business in 1889 as a collector for the original Consumers' Company and continued with the successor, Knickerbocker Ice Company which in 1913 was consolidated with the City Fuel Company forming the Consumers' Company. He remained through all these changes, and after 43 years service, the last twelve as general manager of the ice sales division, he left the Consumers' Company in 1942 and joined the Jefferson Ice Company where he served as sales manager until the time of his death.

He was active in association work, being a director in the National Association of Ice Industries and a past president and life member of the Illinois Association of Ice Industries of which he was one of the organizers, and a trustee of the Chicago District Ice Association which he assisted in forming in 1916. He was a member of the Illinois Athletic Club for 15 years, a former member of the South Shore Country Club for 12 years, immediate past president of the Rotary Club of Chicago, A Mason and a Shriner.

Surviving are his widow, Mrs. Madge Barbaro, two sons, Albert J. and Robert H., and four grandchildren.

Thomas A. Bohon

THE death of Thomas A. Bohon, civic worker and former refrigerated warehouse executive, Louisville, Ky., occurred July 13 at Pleasant Grove Hospital, Anchorage. Mr. Bohon retired in 1929 after serving for 15 years as secretary and treasurer of Merchants Ice & Cold Storage Company. He also served for a time as treasurer of the Kentucky Ice Manufacturers' Association. In 1892 he helped organize the Kentucky Anti-Tuberculosis Association, which later was known as the Louisville Tuberculosis Association. He was a native of Louisville and a former grand knight of the Louisville Council, Knights of Columbus.

Thomas Monroe Nix

THE death of Thomas Monroe Nix, a resident of San Diego, Calif., for the past forty years, and for many years operator of the only ice company in San Diego, occurred July 29 after a brief illness. He was 69. A native of Rome, Georgia, he was a member of the Baptist Church. Survivors include his widow, Mrs. Deffie Nix and two sisters.

BEECHER SMITH, prominent business man, Somerset, Ky., died July 29. He was 83. Mr. Smith came to Somerset from Richmond as a youth. He started his career with a wholesale grocery and established the first ice company in Somerset. He invested in other business ventures throughout this section and amassed a fortune.

BENNIE SABATINO, a Baltimore ice dealer was killed and his wife was injured when the truck in which they were riding crashed through an iron guardrail into twenty feet of water in the harbor basin. His wife was thrown clear of the cab as the truck hurtled from the road and was rescued by passers-by. The crash occurred about 12:45 a.m.

WALTER A. HOWARD, chief engineer of the Lafayette Ice & Coal Co., Lafayette, Ind., died June 26. Mr. Howard had been chief engineer of the company for more than 25 years.

Fred J. Fink

THE death of Fred J. Fink, long time treasurer and general manager of the Tulsa Ice Company, Tulsa, Oklahoma, occurred at his home in North Hollywood, Calif., July 9 after a two-year illness. He had moved from Tulsa to California last December after living in Tulsa since 1907. He had retired officially from the Tulsa Ice Company when the firm discontinued operation last February.

Mr. Fink became general manager and treasurer when the company was organized 50 years ago and saw it grow from a seven ton daily capacity at a small plant to a 265 ton capacity at two large plants. In an interview in 1949 he recalled many obstacles encountered in the early days of the company. Tulsa had no water works fifty years ago and the company drilled a number of wells from which it hauled water to the plant by wagon.

Mr. Fink was active in public affairs throughout his years in Tulsa. He was believed to be the oldest member in length of membership of the Tulsa Elks Lodge. He was a member of the National Association of Ice Industries, past president and life director of the Oklahoma Association of Ice Industries, and a member of the First Presbyterian Church at Marshall, Mo., his birthplace.

Surviving are his widow, Mrs. Alice Fink, two brothers, Charles E. Fink and O. C. Fink, and a sister, Miss Tillie Fink.

Lem Jones

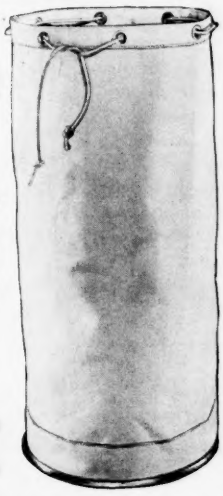
THE death of Lem Jones, retired business man and a civic leader in Sheridan, Ark., for 40 years occurred in a Little Rock hospital August 12. He was 66. Mr. Jones owned Sheridan's first ice plant and had been in the grocery business until he retired last year. He was president of the Grant County bank. He was a Mason and a past president of the Sheridan Rotary Club. He is survived by his widow, Mrs. Claudia Reese Jones and two daughters.

Whitelaw Estate Probated

The estate of Mrs. Charles W. Whitelaw, 89-year old widow of the former president of the Polar Wave Ice & Fuel Co., St. Louis, Mo., who died May 20, has been filed in probate court. The estate is valued at $247,127.

MAXWELL B. LEHMAN, a branch manager for the Polar Wave Ice & Fuel Co., Indianapolis, died July 19 in St. Vincent's Hospital after a four-months illness. A native of Bloomfield, Ind., he had been with the Polar Wave Ice & Fuel Co. for 17 years.

DANDUX ICE BAGS STAND UP BEST!



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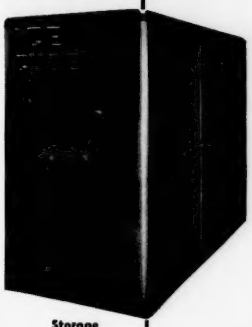

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NEW PLANTS and IMPROVEMENTS

This Department each month presents the more important developments covering new constructions, as well as additions, improvements, remodeling, and installations of new equipment in ice and cold storage plants and other industrial plants that use refrigeration. News notes on all such new constructions and improvements are invited.

Arkansas

Little Rock, Ark.—The Bird Cold Storage Co. reports construction has begun on a 14,000 sq. ft. cold storage addition adjoining the present plant. Slated for completion in February, the addition will permit the plant to store an additional 120 cars of merchandise.

Colorado

Denver, Colo.—The Beatrice Foods Company plans immediate construction of a sub-zero single storage refrigerated warehouse here. Expected completion is some time this fall. The building will be 228 x 115 feet and will have capacity of two million pounds. D. H. Murphy is manager of Beatrice's Denver Warehousing operations.

Florida

Groveland, Fla.—The B & W Canning Co. plans expanding plant facilities increasing frozen concentrated orange juice to 3,000,000 gallons.

Georgia

Gainesville, Ga.—Construction of a $200,000 addition to its poultry plant here has been started by Swift & Company. The addition will bring the processing line from a full-speed capacity of 4,000 to 8,000 birds per hour.

Maine

Portland, Me.—A new refrigerated warehouse with approximately a million cubic feet, ⅓ cooler and ⅔ freezer, has been opened here by Quincy Market Cold Storage & Warehouse Co. of Boston. It will be managed by Paul B. Christensen, vice president.

Massachusetts

New Bedford, Mass.—L. S. Elbridge & Son has announced plans to erect a second floor addition on its property at 52 Front Street. The addition will cost an estimated $8,000 and will provide additional freezing and packing facilities.

Missouri

Carthage, Mo.—The Carthage Ice & Cold Storage Co. will remodel and enlarge a brick building west of the plant, recently purchased. It will have about 9,700 feet of storage space when completed.

St. Joseph, Mo.—Construction has started on a one-story addition to the cold storage plant of the Artesian Ice & Cold Storage Company, to be completed about December 1. The improvement will cost about $20,000.

Nebraska

Omaha, Neb.—The new refrigerated warehouse just completed by the United States Cold Storage Company here embodies all the most recent features for structures of that type. Covering seven acres the building, all on one floor, has 148,000 square feet of floor space, of which 104,000 square feet are refrigerated; 76,500 square feet are freezer and the remainder are cooler or convertible to freezer.

New Jersey

Glassboro, N. J.—The Glassboro Cold Storage Corp. is converting two cooler rooms to freezers. These improvements will provide a freezer capacity for about 7 million pounds of frozen foods.

Ohio

Cleveland, Ohio—Perfection Stove Co. has installed a cold laboratory for testing internal combustion engines, fuels and lubricants, metals and heating devices at ultra cold temperatures.

Troy, Ohio—The Middletown Ice & Coal Co. is constructing a modern refrigerated ice depot at the south city limits of Troy, from which it will supply household and commercial customers with ice. Delivery service will be continued by the present dealers. The company recently purchased the ice tonnage of the Troy Ice & Coal Co. which discontinued the manufacture and sale of ice July 31.

Pennsylvania

Lancaster, Pa.—The Lancaster Ice Manufacturing Co. has under construction a new low temperature refrigerated warehouse with 26,000 cubic feet capacity, according to M. L. Darmstetter, manager.

Washington

Seattle, Wash.—The Best Pie Company plans to install considerable refrigerating facilities in a new bakery plant, including special cooling rooms, freezer room, cool dough room and storage space.

New Incorporation

Picayune, Miss.—Charter of incorporation has been granted Crosby Dairy Products & Ice Company Inc., listing capital stock of $350,000.

Sales and Reorganizations

Carlisle, Ark.—Shuford Staggs, owner and operator of the Carlisle Ice Storage System here for the past five years, has sold the business to Tommy Bray of DeValls Bluff, Ark.

Los Angeles, Calif.—The Terminal Refrigerating Co. has acquired the Burbank Refrigerating Co. in Burbank, Calif. The company will continue as a separate corporation, a wholly owned subsidiary. The plant has about 800,000 cubic feet of space, freezer and cooler. New quick freezing facilities are being installed.

Trucker, Calif.—William F. Curran has purchased the Mattos Ice and Beverage Company from Joseph Mattos.

Newcastle, Ind.—Harold R. Dailey, who since 1939 has operated the Consumers Ice & Fuel Co. as vice president and treasurer, has bought the business and plant from W. Arnold Hanger, New York City, and other stockholders. The transaction was closed in early July.

Durant, Okla.—The Crystal Ice Co. has announced purchase of the business and routes of the Independent Ice Co. The plant and equipment will be dismantled and moved to Paris, Tex.

Fire and Accident Record

Lexa, Ark.—A huge ice storage plant owned by the City Products Company was wrecked by the mysterious collapse of two walls. The plant, used to re-ice refrigerator cars by the Missouri Pacific Railroad, was more than three stories high, and would hold 5,000 tons of ice. Cooling coils were broken as the walls collapsed, releasing clouds of ammonia. Falling bricks damaged several freight cars. Damage was estimated at more than $100,000.

Claremont, Calif.—Fire caused an estimated damage amounting to $2,500 to the Union Ice Company's new storage building under construction. Origin was hot tar being poured by roofers between the retaining wall and the wooden partition. Damage was restricted to a portion of the wall about 25 feet long.

Los Angeles, Calif.—Harold W. Blair, ice truck driver, burned to death when the truck he was driving overturned and brust into flames as he swerved to avoid collision with two cars. Blair was married and father of three children.

Columbus, Ga.—Damage from a four-hour fire at a storage plant of the Atlantic Ice & Coal Co. was estimated at $100,000.

Icy Items

Topeka, Kans.—The Mutual Ice & Cold Storage Co. celebrates 50 years of continuous business activity this year. The company was founded in 1902.

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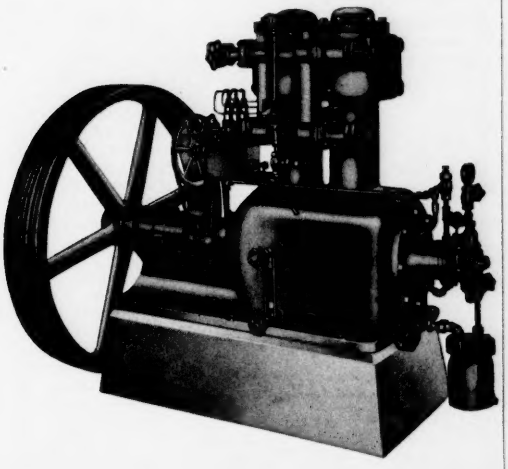

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What's New

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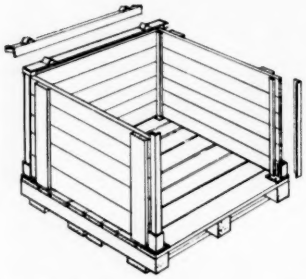
Knock-Down Stacking Box

A NEW, versatile, heavy duty knock-down stacking box is now being produced which takes loads up to 4000-5000 lbs. and may be used as a stacking box, as a stacking bin, as a stacking pallet, and is easily and quickly knocked down and bundled for shipping.



Knock-down stacking box with front panel removed.

This box consists of a heavy-duty wood pallet and four interlocking wood side panels held in place by four structural posts which slip-fit into angle sockets secured to the corners of the pallet with four lag screws. Angle cross bars with alignment angles and end closures slip-fit over the top of these posts to support the box above. The alignment angles help center the box above and prevent slippage.

With all four interlocking side panels in place, a heavy duty, rugged stacking box is available which may be made into a stacking open front bin by removing the front panel as shown in the illustration. The box is assembled quickly in about a minute with no tools, by inserting the structural angle posts into the corner angle sockets, slipping the sides into place and fitting the angle cross bar over the top. It is just as quickly disassembled.

This new K-D Stacking Box is exceptionally economical and costs only about two-thirds of a comparable steel box. It is supplied in any size and any capacity required and at the present time, delivery can be made in from four to five weeks. It is a product of The Paltier Corporation, 1701 Kentucky St., Michigan City, Ind.

Automatic Ramps For Dock to Truck Handling

AUTOMATIC dock ramps provide an effective and useful bridge between warehouse docks and trucks or railroad cars. Power operated ramps made by The Beacon Machinery Co., East St. Louis, Mo., meet a wide range of conditions and operations, adjustable to different height docks. With a power-operated dock ramp built into the dock it is possible, by obtaining the proper type equipment for their application, to provide a bridge so it will not have a grade excessive to hand-pushed carts to enable the truck-loader to push his load directly into the truck and place the material directly into the proper loading position in the truck. There is also a safety factor included in this equipment, lessening the liability of dock accidents. Circulars are available from the company, describing this equipment.

Auto ramp dock for warehouses.

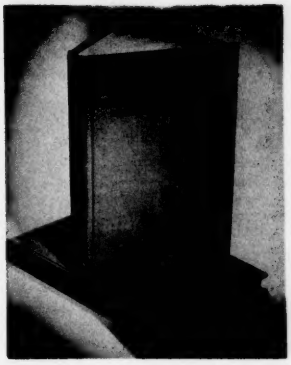
Coil Flusher Cleans Refrigerating Lines and Coils

A MECHANICAL refrigeration coil flusher is on the market, manufactured by the Refrigeration Division of Ansul Chemical Company. The Ansul Dri-Sol Gun forces Ansul Dri-Sol solvent through lines and coils under pressure up to 500 lbs.

The new solvent is said to be non-toxic, non-flammable at temperatures below 130 F. and readily attracts moisture. Tests show that the new solvent will dissolve sludges, wax deposits and other foreign material. The slovent is recommended for "Freon" and methyl chloride systems.

Capacity of the Ansul Dri-Sol Gun is three pints of solvent. The gun is approximately 3½ in. in diameter, 21¼ in. in height and weighs 10 lbs. fully charged.

Refrigeration coil flusher made by Ansul Chemical Co.



The Book of "Refrigeration Knowledge"

Basic Refrigeration is designed to give a good working knowledge of modern refrigeration principles, equipment and its operation. Beginning with the fundamentals and generally understood materials, it progresses through basic details of equipment to application, operation and servicing of systems.

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- Compressor Drives
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- Servicing
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- Instruments and Meters
- Heat Calculations
- Humidity in Refrigeration
- Compressor Calculations I
- Compressor Calculations II
- Refrigerant Lines—Pressure Drops
- Brine in Refrigeration
- Liquid Cooling
- Complete Systems
- Carbon Dioxide—Dry Ice
- Altitude and Its Effect
- Absorption Systems
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Different refrigerants and the various sizes of equipment are all given equal treatment. There are no complicated formulae or mathematics in the book. It develops the subject in logical step-by-step method with clear explanation of all factors.

Special drawings supplement the material in the text and explain basic factors. Of some 340 illustrations, the majority are special drawings which detail fundamental points in an easily understood fashion. Frequent examples are worked out in the text to show step by step solutions.

How automatic controls operate and what they do in the system are explained in simple terms. Parts and their functions are shown. This important field, in present-day refrigeration, is covered in a fashion that tells how to use controls and keep them operating to good advantage.

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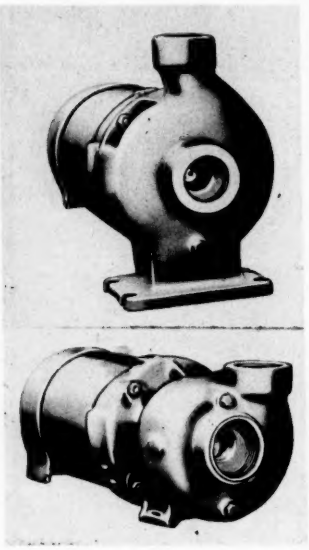
New Line of Pumps

A PACKAGED line of close-coupled pumps of types sac and jmc covering a capacity range from 5 to 150 gpm and heads from 0 to 110 ft.—at speeds of 3500 rpm has been introduced by the Aurora Pump Co. This packaging is to assure immediate off-the-shelf delivery so frequently important because of the wide variety of duties upon which these pumps are used, for general service or as an integral part of equipment manufacturer's product such as air conditioning units, cooling towers, evaporator coolers, milk coolers, hot water circulators, etc.



Two views of Aurora close-coupled pump.

The line includes twenty nine combinations in ¾, 1¼, 1½ and 2 inch sizes and available with either three phase or single phase motors. The casings are vertically split, pump and motor are supported on feet cast integral with pump, suction is located on the end and discharge is vertical. Mechanical seal is standard on all sizes and easily replaced without disturbing suction or discharge connections. The impeller is balanced, of enclosed type, made of high grade bronze, and can be removed without disturbing suction or discharge connections. The motor is built to NEMA specifications and equipped with stainless steel shaft. These pumps are also packaged as pump, base and coupling units with which the customers' motors can be used.

Additional details may be obtained by those interested by writing to the Aurora Pump Company, Aurora, Ill.

New Soldering Flux

A NEW soldering flux which is non corrosive and can be used to solder metals that could not be soldered before is one of the new technical developments described in the current (June) issue of the Bibliography of Technical Reports, now available from the Office of Technical Services, U. S. Department of Commerce.

This issue of the Bibliography lists over 200 government research and development reports made available to the pubic this month. Reports describing technical developments in the chemical, mineral, metalworking, food, textile, and electronic industries are included.

Quickupl, New Threadless-Solderless Fitting

THE new "Quickupl," a fitting which joins pipe or tube without threading or welding has been introduced by the Copper Alloy Foundry, Hillside, N. J. The new development is said to be economical in installation and maintenance, with simplified inventories required. It is expected to appeal to pipe and tube users in all industries because of its economical maintenance and application. Those who are interested may obtain full details from the manufacturer.

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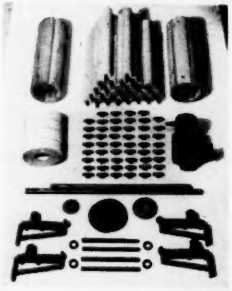

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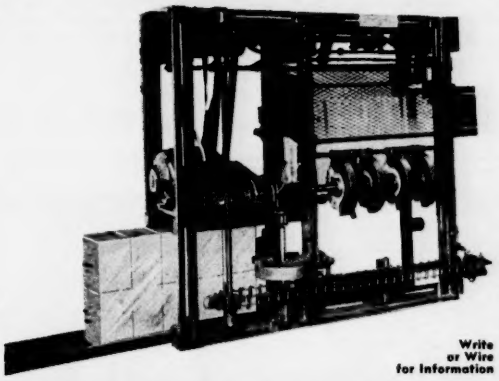

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For year-round satisfaction, blowers must deliver positive Volume at required Pressure and Low power cost. Performance of R-C Rotary Positive Blowers has been proved for many years in large and small plants.

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A DIVISION OF DRESSER INDUSTRIES, INC.

DIMCO CAST ALUMINUM FIN EVAPORATING COIL

★ *Saves Space*
★ *Saves Weight*
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CAN BE USED WITH ANY REFRIGERANT

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DIMCO Evaporators in a Frozen Food Storage Room at Great Lakes Terminal Warehouse, Toledo, Ohio. A typical installation facilitating palletizing.

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SECURELY fastening machinery, hand rails, or equipment of any type to concrete by means of anchor bolts, or permanently repairing chuck holes and breaks in concrete floors, the manufacturer's claim, may be done quickly, easily and safely with Pro-Rok Quick Setting cement. Por-Rok replaces critical lead and sulphur for most bolt-setting operations. Applied cold, there is no heating hazard, and it requires only a few minutes to set up.

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ARMOUR *Ammonia Division*

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MANUFACTURERS' NEWS

Pacific Lumber Appoints Director of Research

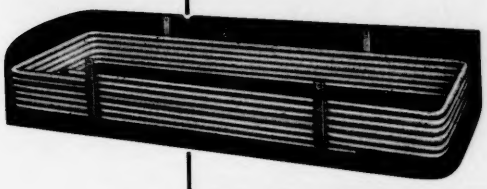
WILLIAM G. Van Beckum, recently appointed Director of Research and Development for The Pacific Lumber Company, will be closely associated with long-range development in the low temperature and home insulation fields, according to an announcement issued by the firm's San Francisco office. In 1931, The Pacific Lumber Company introduced a process for manufacturing redwood bark fiber insulation, which has found wide acceptance under the trade name of "Palco Wool." The manufacture of an insulation board is now under development.

William G. Van Beckum

Since 1948, Mr. Van Beckum has been manager of Technical Service and Assistant Sales Manager, Special Products Division, Weyerhaeuser Timber Company of Longview, Washington. A graduate of St. Norbert College and the University of Wisconsin, he worked under a TAPPI Fellowship for three years at the U. S. Forest Products Laboratory at Madison, Wisconsin. In 1939 he joined the Wood Conversion Company, and in 1942 became Chief of the Chemistry Section of the Weyerhaeuser Development Department, of which he was named Assistant Manager in 1946.

Long recognized as a major producer of redwood lumber, The Pacific Lumber Company has pioneered research in utilization of bark and other wood raw materials. The company's chemical derivatives and other by-products are finding application in the manufacture of ceramics and additional industrial products. Redwood bark fiber insulation is one of the company's major products. Production facilities are located in Scotia, California, in the heart of the Redwood Empire. Van Beckum will make his headquarters at the firm's San Francisco office.

Stainless PIPE COIL BENDING



Many customers, equipped to do iron pipe bending in their own plants, hesitate to tackle stainless and turn to CHICAGO NIPPLE for these special coils. They know that we have the equipment and the experience necessary to make coils in stainless to their exact specifications, with welds that are strong and tight.

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Dependable.. Automatic.. Refrigerated

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ESTAB. 1880

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Evaporator Pressure Controls
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FREEZING PLANT ACCUMULATOR
MS Float Switch on suction line accumulator in low temperature food processing plant.

Mojonnier MS FLOAT SWITCH
"THE FLOAT SWITCH WITH THE PICTURE WINDOW"

Creamery Package Booth At Dairy Exposition

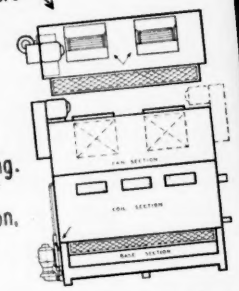
THE Creamery Package Mfg. Company is looking forward to greeting old friends and meeting new friends at the Dairy Industries Exposition in Chicago this September. CP's Exhibit Booth A-68 will occupy approximately 6000 square feet of floor space. The background of the booth will be highlighted by murals depicting the interiors of modern dairy plants as well as murals that trace the history of various CP dairy processing machines. A movie in color depicting a modern Cuban Dairy Plant will be shown continuously in a corner of the booth. The latest in farm cooling tanks will be shown, with a modern milking parlor hook-up. The latest in CP refrigeration machinery will also be shown including a new 200 ton capacity compressor.

This exhibit will feature a cutaway model of a CP Type "K" Multi-Cylinder Compressor which will be running to show how all the component parts operate. It will also show a cylindrical storage tank with a refrigerated wall, a new Series "40" type Pressure Wall Tank, the CP Ice Builder, and the new Roto-Master rotary can washer.

Pages from an ENGINEER'S NOTEBOOK

MEMO: Purchasing Dept.

SUBJECT: Acme Evaporative Condensers



1. All prime surface coils, easily accessible.
2. Ball bearings are styled to prevent grease migration, moisture traveling.
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RECOMMEND WE SPECIFY ACME S.J.A.

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Address Dept. IR

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New Vending Equipment

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Warner, Ga., Williams Ice Co.
Warner, Ga., Williams Ice Co.
Shelbyville, Ind., Deprez Ice & Fuel.
Abilene, Kans., Belle Springs Creamery.
St. Charles Shore, Mich., Lee Bros.
Tucumari, New Mex., Tucumari Ice Co.
Dayton, Ohio, City Products Corp.
Port Clinton, Ohio, American Ice Co.
Okmulgee, Okla., Peoples Ice.
Sallisaw, Okla., Sallisaw Ice Co.
Pryor, Okla., Peoples Ice Co.
Dublin, Tex., Home Ice Co.
Brownsville, Tex., Russell Davila Co.
Everett, Wash., American Investment Co.

Cork Company Changes Name

CORK Import Corporation has announced at its main office in Englewood, N. J., that its corporate name has been changed to National Cork Company.

Cork Import Corporation was formed in 1923 to sell in the United States cork products produced in affiliated Spanish factories. It was the first American cork company to sell cork insulation entirely through independent distributors. Its trade names, Novoid for insulation and Acorn for champagne and wine corks, have become well established and synonmous with both quality and dependable service.

In the interim, Cork Import Corporation has increased its operations through the sale of domestic cork insulation and cigarette tipping. Imports are now but a small part of its annual volume. The new name will be truly indicative of its present day activities and will emphasize its close connection to the domestic cork industry.

CATALOGS and BULLETINS

Ice Making Systems

A FOUR-PAGE bulletin has been issued by the Frick Co., Waynesboro, Pa. on ice making systems, with a description of the ice making process, illustrated with drawings and photographs. The principle of ice making is discussed, with explanation of raw water ice, the ice tank, the flooded system, crane and hoist, can dumps, air agitation system, can filler, accumulator, and other steps in the ice making process.

THE BUYERS DIRECTORY

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ABSORBERS
Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

AIR COMPRESSORS
Frick Co., Waynesboro, Pa.

AIR CONDITIONING EQUIPMENT
Carrier Corp., Syracuse, N. Y.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Niagara Blower Co., New York, N. Y.

AMMONIA COMPRESSOR VALVES
Frick Co., Waynesboro, Pa.

AMMONIA COMPRESSORS
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Enterprise Equipment Corp., Yonkers, N. Y.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kehoe Machinery Co., Inc., R. P., West Englewood, N. J.
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Vogt Machine Co., Henry, Louisville, Ky.

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Kramer Trenton Co., Trenton, N. J.

AMMONIA FLOAT VALVES
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Armstrong Machine Works, Three Rivers, Mich.
Frick Co., Waynesvoro, Pa.
Phillips & Co., H. A., Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

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Bower Chemical Mfg. Co., Henry Philadelphia, Pa.
du Pont, Polychemicals Dept., Wilmington, Delaware

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International Salt Co. Inc., Scranton, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

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Howe Ice Machine Co., Chicago, Ill.
Kehoe Machinery Co., Inc., R. F., West Englewood, N. J.
National Pipe Bending Co., New Haven, Conn.
Rempe Company, Chicago, Ill.
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Vogt Machine Co., Henry, Louisville, Ky.

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Shank Co., Cyrus, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

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Ophuls & Associates, Fred, New York, N. Y.

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Frick Co., Waynesboro, Pa.
Lumenite Electronic Co., Chicago, Ill.
Phillips & Co., H. A., Chicago, Ill.
Rex Engineering & Sales Co., Oklahoma City, Okla.

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Daniels, Inc., C. R., Baltimore, Md.
Index Coupon & Supply Co., La Porte, Ind.
Union Bag & Paper Corp., New York, N. Y.

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Union Bag & Paper Co., New York, N. Y.

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Martocello & Co., Jos. A., Philadelphia, Penna.
Vogt Machine Co., Henry, Louisville, Ky.

BLOWERS
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Roots-Connersville Blower Corp., Connersville, Ind.

BOILERS
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Vogt Machine Co., Henry, Louisville, Ky.

BOILER TUBES
Byers Co., A. M., Pittsburgh, Pa.

BOOKS—TECHNICAL
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Frick Co., Waynesboro, Pa.
Reynolds Mfg. Co., Springfield, Mo.
Roots-Connersville Blower Corp., Connersville, Ky.

BRINE COOLERS
Acme Industries, Inc., Jackson, Mich.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Enterprise Equipment Corp., Yonkers, N. Y.
Frick Co., Waynesboro, Pa.
Kehoe Machinery Co., Inc., R. P., West Englewood, N. J.
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CHECK your system for excess head pressure . . . Each 4 lbs. excess raises the load on your compressor, reduces its capacity by 1% and increases power costs 2%! Air and other non-condensables collecting in the condenser and receiver are nearly always the cause. An Armstrong Purger rids the system of air and keeps it that way...reduces loss of refrigerant...saves labor and time. The Purger pays for itself in short order.

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- Never Forgets
- Saves Power

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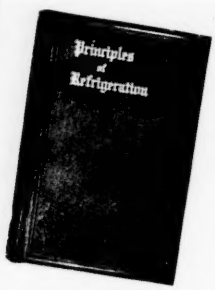

PRINCIPLES OF REFRIGERATION, 3rd Edition (1947) revised by Wm. H. Motz, provides information and data for the practicing refrigeration engineer. Of special interest to erecting and operating refrigerating engineers, refrigeration machinery sales engineers, persons employed in building refrigerating machinery and those employed in ice making, cold storage plants or other establishments equipped with refrigerating machinery. Contains information that the refrigerating engineer should know in order that he may have complete and up-to-date knowledge.

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Vogt Machine Co., Henry, Louisville, Ky.

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Lilly Co., The, Memphis, Tenn.
Tri-Pak Machinery Service Inc., Harlingen, Tex.

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Rempe Company, Chicago, Ill.
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Jamison Cold Stge. Door Co., Hagerstown, Md.
Refrigeration Engineering Co., Montgomery, Minn.

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Enterprise Equipment Corp., Yonkers, N. Y.
Frick Company, Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
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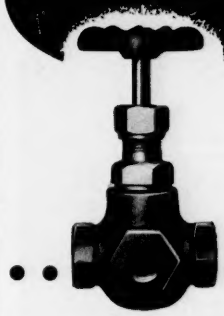

3-WAY DUAL SHUT-OFF VALVE

For use where Refrigeration Codes require dual relief valve installations. Stainless steel stem. Indicator plate on hand wheel shows position of valve shut off. Completely rust-proofed.

RELIEF VALVES

For Ammonia and Freon. One piece body design—rustproof finish. Internal construction—stainless steel—will not corrode. Positive relief action. Pressures from 75 to 400 lbs.

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CYRUS SHANK CO.
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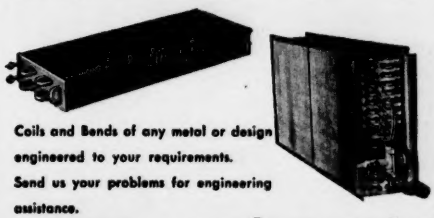
LOOK TO REMPE!

PIPE COILS • FIN COILS
For **Refrigeration, Air Conditioning, and Heating**

Rempe Coils are accepted in the industry as quality equipment that is built for long service without maintenance. Rempe Coils are used on the most difficult jobs and forgotten. This confidence has been earned the hard way—through proper engineering, good quality materials and precision manufacturing.



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REMPE COMPANY
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Is Space an Important Factor?

Then Use This Distinguished Line of Close-Coupled Pumps

These GMC Pumps are ideal for a multitude of jobs. Smooth and efficient whether vertical, horizontal, up-side-down or any inclination. Low first cost, low power and maintenance costs. Top quality "by Aurora."
Caps. 10 to 800 G.P.M. Heads to 250 Ft.
PUMPS "by Aurora"
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Write TODAY for CONDENSED CATALOG "M"
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also BULLETIN 120

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78 Loucks Street, Aurora, Illinois

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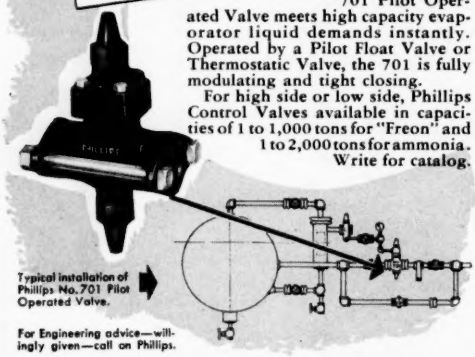
with **PHILLIPS** FLOAT CONTROLS

PILOT OPERATED LIQUID CONTROL VALVES

The Phillips No. 701 Pilot Operated Valve meets high capacity evaporator liquid demands instantly. Operated by a Pilot Float Valve or Thermostatic Valve, the 701 is fully modulating and tight closing.

For high side or low side, Phillips Control Valves available in capacities of 1 to 1,000 tons for "Freon" and 1 to 2,000 tons for ammonia. Write for catalog.



Typical installation of Phillips No. 701 Pilot Operated Valve.

For Engineering advice—willingly given—call on Phillips.

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Index Coupon & Supply Co., La Porte, Ind.
Lilly Co., The, Memphis, Tenn.
Vivian Mfg. Co., St. Louis, Mo.

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Layne & Bowler, Inc., Memphis, Tenn.

PUMPS, ROTARY
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Roots-Connersville Blower Corp., Connersville, Ind.

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Vivian Mfg. Co., St. Louis, Mo.

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Taylor Instrument Cos., Rochester, N. Y.

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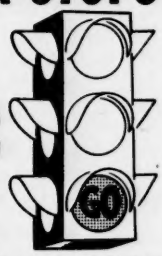
TRAFFIC NEVER STOPS

when you repair your floors with

PERMA*Mix*-C



FOR PATCHING IN TEMPERATURES FROM 5° ABOVE ZERO TO -30° BELOW

3 EASY STEPS TO FOLLOW:

- **Clean area to be patched. Apply primer supplied in drum. Prime about 2" outside of patch.**
- **Fill area with PERMAMIX-C, just as it comes from the package, allowing sufficient material for slight crown.**
- **Tamp solidly in place and resume traffic immediately.**

No mixing, waiting or production delays when you repair your floors the easy, fast PERMAMIX-C way. Comes in handy, durable 50 lb. net weight drums.

ALSO AVAILABLE! Standard PERMAMIX for patching in temperatures from 10° to 100° above zero...using the same 3 easy steps.

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Your Assurance of Best Quality

REFRIGERATION COILS

made by The National

PIPE BENDING COMPANY

All features that you demand are furnished regularly in National Pipe Bending Refrigeration coils—smooth bends, perfect welds, measurements exact.

For long service, specify coils by the National

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Established 1883

162 River St. New Haven, Conn.

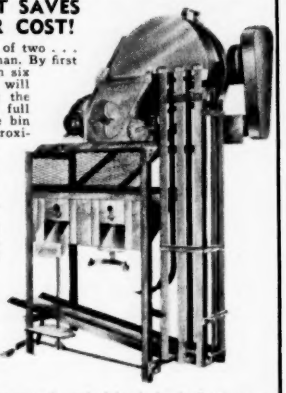
Bateman Automatic LOADER CRUSHER

CRUSHER ICE UNIT SAVES TIME AND LABOR COST!

One man can do the work of two . . . loader acting as the second man. By first loading the hopper slide with six 50-lb. blocks of ice, operator will not have to bother loading the crusher and can devote his full time to bagging ice. Storage bin under crusher will hold approximately 100-lbs. of ice.

ELEVATOR: Is so timed as to allow each block of ice to be crushed before the next block enters crusher. Crusher is set to grind 175-lbs. a minute.

BAG HOLDER: A half ring holds the top of bag in place while bottom of bag sits on floor or platform.



FOOT-OPERATED DOOR FOR LOADER CRUSHER

Operator can fill paper bags at a very fast rate for each magazine of ice used. Operator holds bag with both hands, pushing down on foot lever will open the chute allowing the ice to flow into the bag. When the proper amount of crushed ice is in the bag, operator removes foot from pedal cutting the flow of ice off. The operator while he has the bag in this position can tie the bag while the bin is being filled for another bag.

Elevator can be stopped at any time to allow the operator more time if needed.

LOADER CRUSHER $715.00
(¾ h.p. motor at prevailing price)
F.O.B. Mineral Wells, Texas.

Bateman Write For Details Mineral Wells, Texas

Ice Processing Equipment

May we supply paper bags for your Cube and Sized Ice party service?

Also Headquarters for . . .

Coupon books

Signal cards

Canvas Bags and Tarps

Crushers

Small tools.

Our modern printing plant can also furnish business stationery, office forms, etc. Give us a Trial on these items.

Complete catalog for the asking.

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LaPorte, Indiana

Philadelphia Pipe Coils
ESTABLISHED 1880
Continuous Welded Pipe Coils of Any Metal, Size or Design
PHILADELPHIA PIPE BENDING CO
FIFTH STREET & N. P. R. R
PHILADELPHIA

USED ICE MACHINES & EQUIPMENT

- COMPRESSORS—3x3 to 12x12
- COMPRESSORS—with or without MOTORS
- COMPRESSORS—Diesel or Steam driven
- COMPLETE ICE PLANTS—15 to 50 Tons
- CONDENSERS—TRAVELING CRANES—PIPE — ICE CANS — NEW and USED

See Our Monthly Specials in the Classified Columns

Write or call for complete list of new and reconditioned ice making equipment.

ROBERT P. KEHOE MACHINERY CO., INC.
278 W. Englewood Ave. West Englewood, N. J.
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CEMCO

Double Gig Ice Hoist
Fast - Sturdy -
Dependable -

Send for details

THE CAPITAL ELEVATOR & MFG. CO.
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POSITIONS AND HELP WANTED

WAREHOUSE EXECUTIVE AVAILABLE—thoroughly experienced in office methods, solicitation and all administrative and operational procedures, except engine room operation. Well acquainted with national storage accounts. Progressive, mature, dependable, with excellent references. Will locate anywhere. Write Box SP-12, c/o Ice and Refrigeration.

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FOR SALE—25 ton electric driven ice plant. 9x9 Frick and 7½x7½ compressors. Delivery equipment includes 5 ice trucks. Will sell buildings with or without equipment. Address Box SP-7, c/o Ice and Refrigeration.

FOR SALE—Complete 65 ton ice plant in Illinois. Three ice storages suitable for freezer storage. Two Fairbanks-Morse Diesels 150 h.p. each, 2 Vilter compressors 9½x9½ and 10½x10½. Plant served by two major railroads. Will sell entire plant or machy. and equipt. Address Box SP-6, c/o Ice and Refrigeration.

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FOR SALE—Small sizes ammonia compressors, self-contained units 6x6 and 9x9 with motors, 7½x7½ with synchronous motor. Ice tanks, coils, brine coolers, York trunk coil, agitators, cans, blowers. We desire good equipment for export. Parke Pettegrew & Son Co., 370 West Broad St., Columbus 8, Ohio.

WANTED TO BUY—Used York ammonia compressors, sizes 3x3, 4x4 or 5x5. Desire two-cylinder machines without motors or accessories. In reply give complete information as to age, condition, serial number and price expected. The Union Service Corporation, 426 North High St., Columbus 15, Ohio.

FOR SALE

Complete ice making plants, ammonia compressors all sizes, shell & tube condensers, brine coolers, ice cans, valves and fittings.

B & E REFRIGERATING CO.
2 ORANGE ST., NEWARK 2, N. J.
Phone: Mitchell 3-7790 Cable Address "BERECO"

COMPLETE ICE MAKING PLANTS

50 ton Frick, 27 can pull, evapor. condensers.
60 ton DeLaVergne, 14 can pull.
35 ton York, Diesel drive, 6 can pull.

AMMONIA COMPRESSORS

1—12½x12½ York, 175 h.p. motor.
2—10x10 Yorks, 100 h.p. motors.
2—8½x8½ Vilters, 75 h.p. motors.
1—8x8 York, 60 h.p. motor.
1—7½x7½ York, high speed.

Perfection "Special" ice scoring machine, 20,000 ft. 1¼" ammonia pipe, Arctic Pownall ice lifting hooks, ice cans, blowers, etc.

JOHN F. CARSON
2829 N. Broad St. Philadelphia 32, Pa.
BAldwin 9-8549

FOR SALE—One 3x3, one 4x4, one 5x5 self-contained Yorks. 3x3, 4x4, 5x5, 6x6, 7½x7½, 8x8, 9x9 York compressors, splash lubrication. Receivers, all sizes. Ammonia valves up to 3". Write E. Niebling, 1546 St. Clair Ave., Mt. Healthy, Cincinnati 31, O.

FOR SALE—One 10 h.p., 3 cyl. Universal Freon condensing unit with 10 h.p. motor and starter; less than one year old. McQuay Zero Pak Model X-3 for ammonia, designed for use as combination sharp freezer and blower type locker storage room cooler, suitable for 300 lockers. One 5½"x5½" 2-cyl. Howe ammonia compressor, current model, recently overhauled. 1 ammonia receiver 20"x7'-0"—like new. Arctic Engineering Corporation, 2815 West Montrose Ave., Chicago 18, Ill.

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1—Vilter 8½x8½ w/75 h.p. motor	2250.00
1—Lipman 7½x7½ w/50 h.p. motor	1350.00

Our current catalog sheets on request.
Please let us know what you have for sale.

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Box 6246 Dallas, Texas

Dont' ● ● or by
let your ● ● doing a
profits go ● ● job the old
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having a piece ● ● classified ad
of idle machinery ● ● will find a buy-
that can be con- ● ● er or the equip-
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FOR SALE
KEHOE MONTHLY SPECIALS

2—7¼x7¼ high-speed Bakers.
2—8x8 high-speed Carbondale Compressors.
1—9x9 high-speed Worthington Compressor.
3—sets of 10x10 duplex York or Frick, with 225 h.p. syn. motor 300 r.p.m.

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Phone: TEaneck 7-3916

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Shepard-Niles Over-Head traveling Ice Bridge Crane, 51'2" span
3 motors 220-3-60 form 41 class R-1.
USED WORTHINGTON DIESELS
Heavy duty Vertical Engines—like new.
1—60 h.p., 1—120 h.p., 1—210 h.p.

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Box 5033 Phone 4-1195 Tampa 5, Fla.

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2—Bruce-Macbeth gas engines vertical twin cylinder 4 cycle gas engines tank type with flywheels, $1,000.00 ea. Good condition.
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250—extra good cans 11x22x50 inside, $4.00 each F.O.B. Bonham.
350—good average cans 11x22x46 inside, $3.00 each, F.O.B. Bonham.
Brine tank, size 48'x21' and set of Frick Uniflow tank coils with accumulator and valves.

INDEPENDENT ICE CO.
3714 Commerce St. Dallas 1, Texas

FOR SALE—New electric switchboard-generators and alternators—and 2 Bruce-Macbeth gas engines as follows: Three panel solid steel enclosed switchboard with two 80 K.W. generating dual panels and one distribution panel complete with automatic voltage regulators, K.W. meters, K.W. hour meters and synchronizing panel for two-three phase, 60 cyl., 220 volt, 64 K.W. General Electric generator and alternators; also two 100 h.p. Bruce-Macbeth gas engines; good condition. Will sell separately. Diamond Ice Co., 120 S. 5th St., Purcell, Okla.

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Complete Ice Plants 15-75 Ton
Ammonia Compressors, 3" x 3" to 12½" x 14½"
Condensers, Cranes, Blowers, coring Machines, Ice Cans—Various sizes.
Write or wire us on any equipment you may need.

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COMPLETE PLANT DESIGNS INCLUDING
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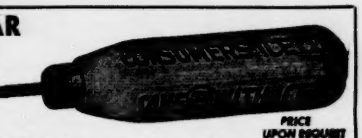
ICE TOOLS AND SUPPLIES
WE CONTINUE YEAR AFTER YEAR
to make the kind of Ice Picks that will give YOUR customers satisfaction and build up GOOD WILL FOR YOU.

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VIVIAN MANUFACTURING CO. 4132-38 Folsom Ave., St. Louis 10, Mo.

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it's All in knowing
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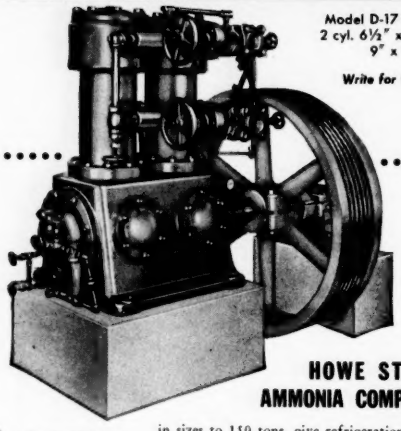


Model D-17 and D-40
2 cyl. 6½" x 6½" and 9" x 9"

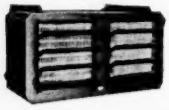
Write for Catalog

HOWE STANDARD AMMONIA COMPRESSORS

A size and type for every job!

in sizes to 150 tons, give refrigeration that's exact for your needs. For difficult two-temperature jobs, use HOWE "ME" Compressors. You save on first cost, power, installation and maintenance.

HOWE POLAR CIRCLE COILS produce 6-way savings: price, space, labor, weight, refrigerant and freight. Built for heavy duty use in meat packing, ice cream, quick freezing, ice and cold storage plants. Provide greatly improved refrigeration that assures better product control. Write for details.



DOUBLE FAN UNIT COOLER

40 YEAR'S SPECIALIZATION

Since 1912 manufacturers of ammonia compressors, condensers, coolers, fin coils, locker freezing units, air conditioning (cooling) equipment.

A few territories still open . . . write for details about the HOWE profit-plan for new distributors.

HOWE ICE MACHINE CO.
2829 Montrose Ave., Chgo 18 Cable: HIMCO, Chicago
DISTRIBUTORS IN PRINCIPAL CITIES

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A NEW INSULATION

Armstrong's PLASTICORK

Armstrong's Plasticork is a brand-new, low-temperature insulation. It's a cork-and-rubber composition that can be applied to any cold line fitting. The workman molds a Plasticork fitting cover right on the job—builds it up by hand over the fitting to be insulated.

Where fittings are close to each other or to wall surfaces, Plasticork makes the work faster and easier. It does away with the time-consuming task of cutting each regular cover to fit these difficult places.

Waiting for special factory covers causes delay on many cork covering jobs, too. With Plasticork, special fittings can be insulated immediately. You don't need factory covers for them.

Plasticork has excellent insulation value. It's 80% cork by volume. Applied in the same thickness as the cork covering on the adjacent piping, its efficiency is comparable to factory-made cork covers.

With Plasticork, you get a neat job that's difficult to distinguish from conventional covers. Plasticork holds its moldable characteristics for years. It's an item you can stock and use any time to insulate any fitting. It can even be removed and used again without loss of workability or efficiency.

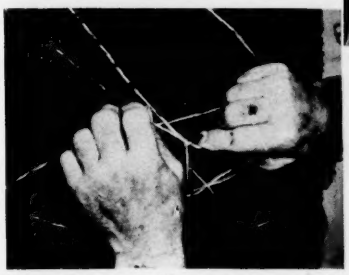
Plasticork is shipped in cardboard cartons containing 5, 10, 20, and 40 lbs. Weight is 15 lbs. per cu. ft. Sundries for application can be supplied on order.

SEND FOR FREE BOOKLET:

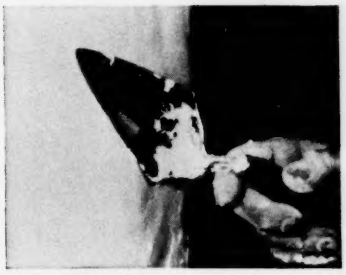
Get a complete description of Plasticork, plus application specifications and coverage data. Write today for the 8-page booklet, "Armstrong's Plasticork." Address Armstrong Cork Company, 4509 Concord Street, Lancaster, Pennsylvania.

ARMSTRONG'S INDUSTRIAL INSULATIONS

1. Plasticork is packed firmly about fitting that has first been coated with Plasticork Primer.



2. Plasticork is then molded to the proper thickness and held in place with either twine or tape.



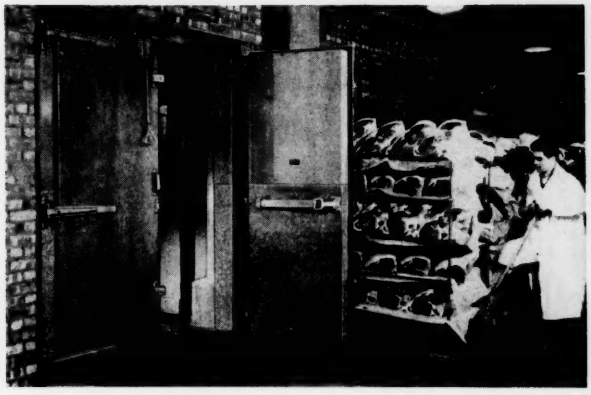
3. A ¼" thickness of Keene's Cement is trowelled to a smooth finish directly over the Plasticork.

4. Two coats of Armstrong's Weatherproof Plastic are brushed on to provide a tight vapor seal.

WIDER OPENING—*Speedier Handling*

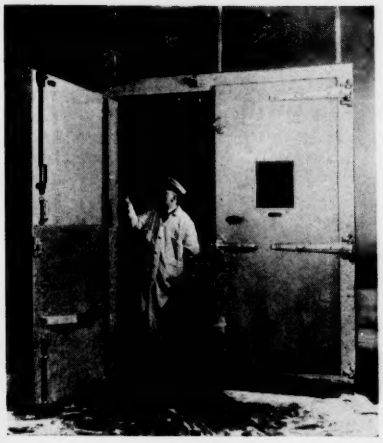
of meats and perishable foods with

JAMISON Series "50" Double Doors



● Today's *busy* tempo in the vast handling and storage of foods calls for speed and efficiency. There's no time to be lost, no labor to be lost. Jamison Double Doors fill the bill because they're twice as wide and can handle twice as much traffic in moving stock in and out of the refrigerated space.

These 3 views of Jamison Double Doors in use at Illinois Packing Company portray space and speed. Notice the inside metal kickplate—the handy bump-open bar. Here's *your door* for extra years of trouble-free, efficient operation. Jamison Cold Storage Door Company, Hagerstown, Md., U.S.A.



THERE'S A JAMISON DOOR TO BEST FILL YOUR SPECIFIC NEEDS

JAMISON

HAGERSTOWN, MARYLAND, U. S. A.

The leader for over 50 years